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Classification of Public Domain

UNITED STATES
DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Missouri River Basin Studies
1965

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Land Planning and Classification Report
# of the public domain lands
in the

UPPER YELLOWSTONE RIVER AREA

MONTANA and WYOMING

A Missouri River Basin Investigation

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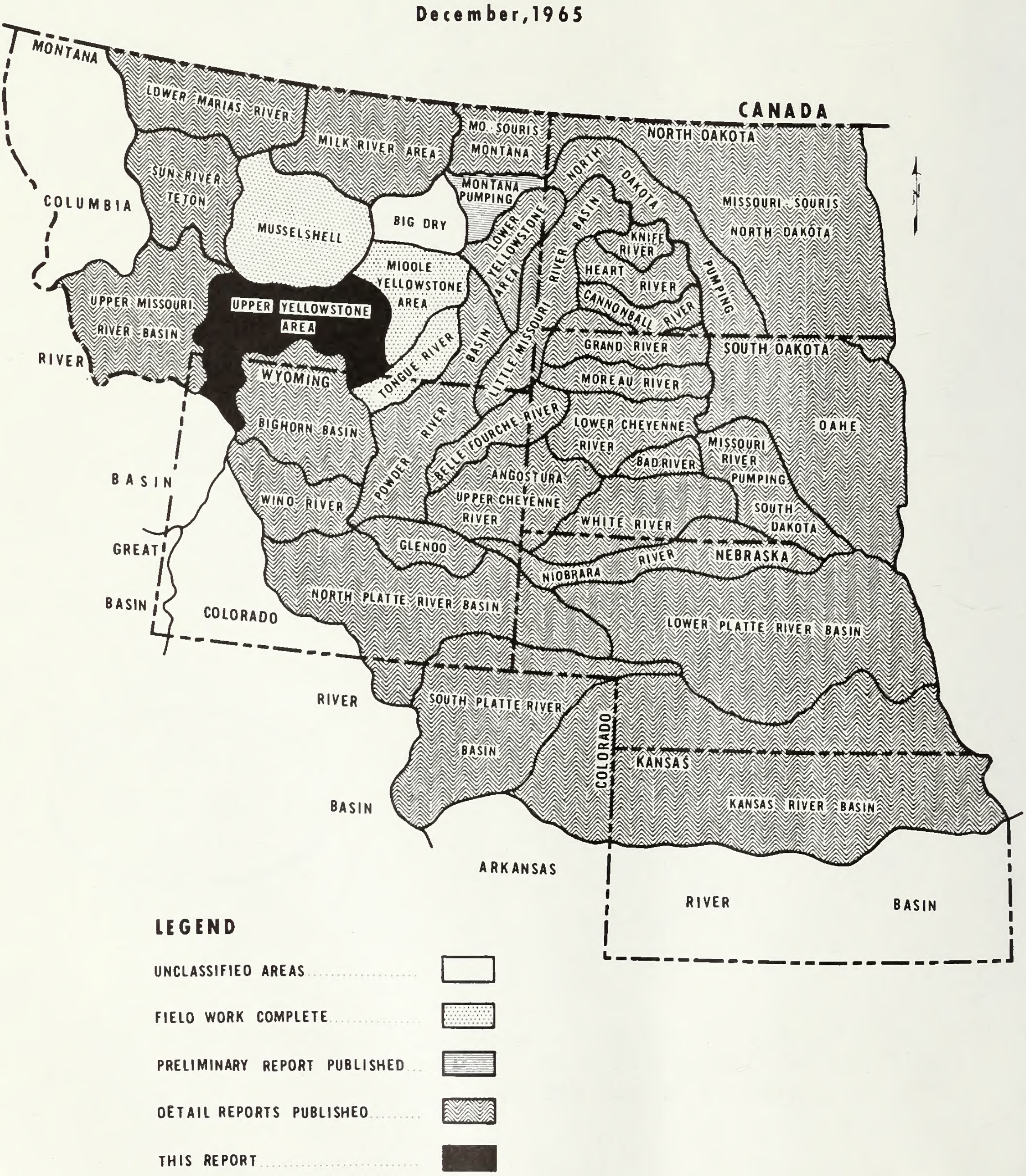
PRESENT STATUS OF BUREAU OF LAND MANAGEMENT STUDIES IN THE MISSOURI RIVER BASIN

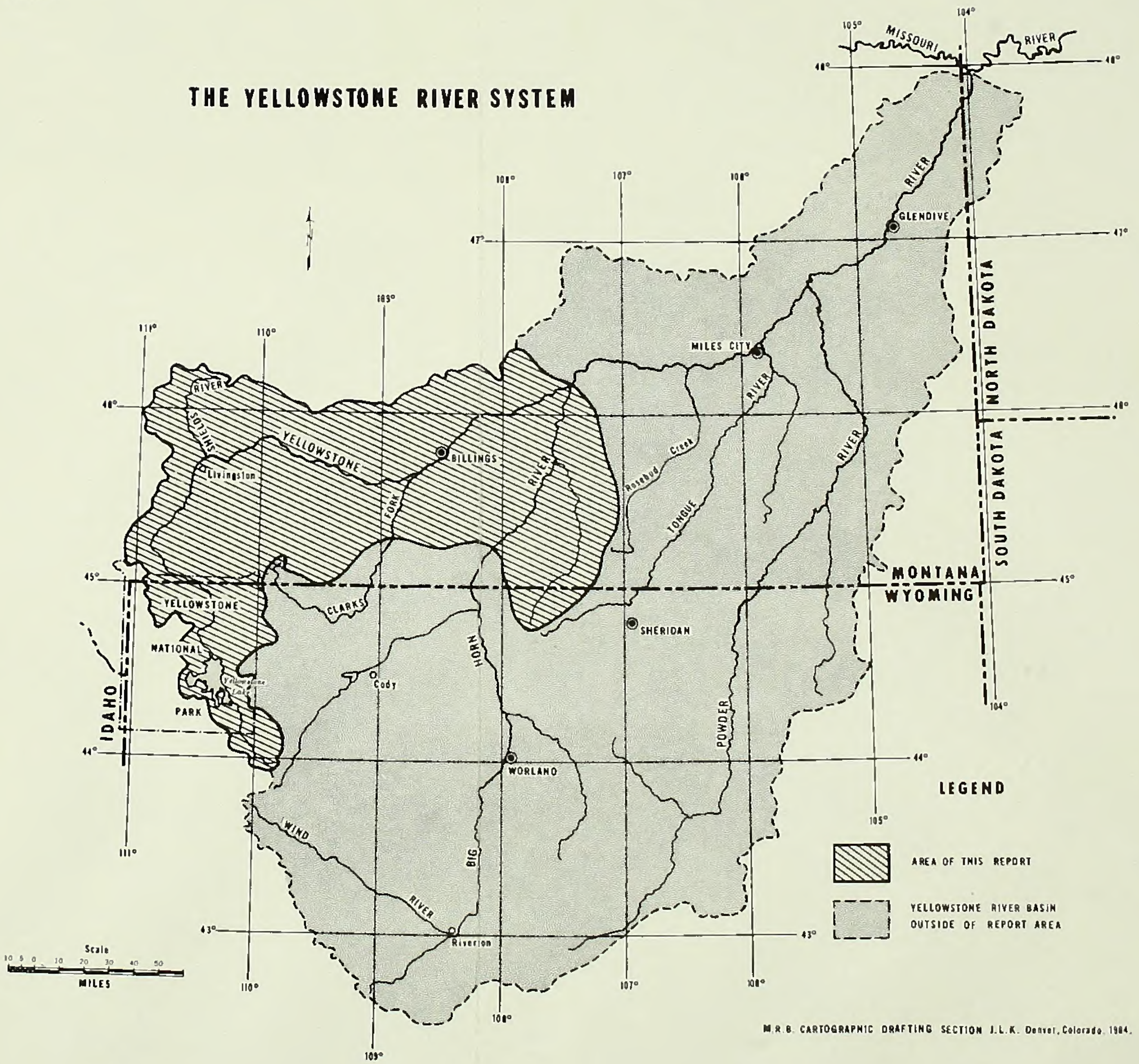
(LAND CLASSIFICATION)

December, 1965



M.R.B. CARTOGRAPHIC DRAFTING SECTION J.L.K. Denver, Colorado. 1964.

Figure 1



THE YELLOWSTONE RIVER SYSTEM

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FOREWORD

This report presents an analysis of the physical, economic, and social factors of the Upper Yellowstone Sub-basin of south-central Montana, as they apply to the public lands which are administered by the Bureau of Land Management in trust for the people of the United States.

This publication is the 32nd in a series of 37 reports prepared by the Missouri Basin Field Group of the Bureau of Land Management in support of the Missouri River Project. That Project, which is a basin development program of the Department of the Interior, finds its basic authority in the Flood Control Act of 1944 and is prosecuted by the Secretary of the Interior through the Bureau of Reclamation. The Department, through the latter agency, finances Bureau of Land Management participation by transfer of funds.

Sufficient information is presented in this report to consider the specific problems and to make recommendations for the management and tenure of the public domain lands. The purpose of the detailed study of each tract is to promote its use in the best interests of the public, compatible with proper conservation practices. Public agencies, both Federal and local, interested in utilizing these lands for their official programs, are told of their location, description and prospective utility by two means, this report and the detailed accounts of each isolated tract.

For each isolated tract of land, a classification report was prepared, complete with maps, details of condition, and recommendations for management or disposition. Those reports, summarized in the following publication, are filed in the Denver Service Center of the Bureau of Land Management in Denver, with appropriate copies in the Billings District Office of the agency. Aerial photographs of current date were utilized in the study of the public lands and so much of the adjacent areas as was necessary to insure continuity of the effort.

The drainage basin of the Yellowstone River, as a whole, is so extensive it was found convenient to handle the discussion of its public lands by sub-basins. Separate sub-basin reports for the Yellowstone system were published for the Wind River in 1949, the Powder River in 1950, the Big Horn Basin in 1955, and the Lower Yellowstone in 1958. Publication of the subject report, plus the Tongue and Middle Yellowstone Reports, will complete the series for the Yellowstone Drainage. Field work is complete and reports are in progress for the latter two sub-basins.

One feature of this report is the use of historical accounts of the sub-basin. These accounts cover the basin fairly well in a period starting from 1805 with Larocque and 1806 with William Clark to the 1860's. Following this explorers era the next pertinent comments were the land classification reports of the 1920's by the U. S. Geological Survey. These interim reports serve particularly well for comparisons with present day conditions.

The field inventory, analysis of data, and preparation of the report were directed by Russell Kifer, Missouri River Basin Field Committee Representative, and by Richard D. Burr, Supervisory Range Conservationist. In the latter stages, overall guidance was provided by Montana State Director Edgar I. Rowland. Editing and technical assistance were provided by Eugene L. Schmidt, Missouri River Basin Program Specialist. The maps were prepared under direction of Draftsman John Kovacs. Valuable assistance was rendered in the field by the Bureau of Land Management District Office in Billings.

SUMMARY

The sub-basin of the Upper Yellowstone River, as discussed in this report, is in the south-central section of Montana, adjacent to the Wyoming border, it enters Wyoming at the Yellowstone National Park in the west and on the Big Horn mountains in the east. Its drainage area extends north and east from the headwaters of the Yellowstone River to the confluence of the Big Horn River, approximately 90 miles downstream from Billings. At that point the Middle Yellowstone sub-basin begins.

The limits of the Upper Yellowstone system on the west is the common divide with the tributaries of the Upper Missouri, and on the north with the divide shared with the Musselshell River. To the east and south are other sub-basins of the main Yellowstone.

Over 11,400,000 acres in 12 counties make up the Upper Yellowstone Area. Of that amount, 134,000 acres are administered by the Bureau of Land Management. The Crow Indian reservation, the Custer, Gallatin and Big Horn National Forests and Yellowstone National Park comrpise an additional 5,096,000 acres. Private and miscellaneous public lands account for the remaining 6,170,000 acres.

The topography of the sub-basin varies from rolling plains to the most remote and rugged mountains. Elevations vary from 2,800 feet at the mouth of the Big Horn River to more than 12,000 feet in the Absaroka Range.

Three hundred ninety miles of the Yellowstone River's 670-mile total length lie within this sub-basin. Its principal tributaries are the Shields, the Clark's Fork and the Big Horn Rivers. The average annual discharge of the Yellowstone River below its confluence with the Big Horn is approximately 7½ million acre-feet.

The population of the Upper Yellowstone sub-basin is concentrated around Billings, Montana. As the county seat of Yellowstone County, Billings numbers approximately 80,000 persons in its metropolitan area; it is the largest trade center within the basin.

Lands administered by the Bureau of Land Management, which are the principal subject of this report, are distributed throughout the Upper Yellowstone sub-basin, with the greatest frequency of tracts found in northern Yellowstone, northern Treasure, and central Sweetgrass counties of Montana. These

lands are principally range. Vegetation is dominated by good quality perennial grasses. Modern day comparison of range land forage with historical accounts discloses remarkably little variation over the past 160 years. The current study disclosed nine percent of the public lands to be in "excellent" condition, 59 percent as being in "good"condition and 26 percent as "fair", with only 3 percent being placed in the "poor" category. Three percent of the land was not rated because of its being in water surface, barren, or timbered.

Timber stands are concentrated in the western part of the sub-basin, where Douglasfir and lodgepole pine dominate; in the east ponderosa pine is important. The public lands are not important timber producers, only about 3,000 acres are primarily suited to that purpose, although 30,000 acres support trees of some description.

Over the entire sub-basin, 35 percent of the soils were found to have good potential as high producing grass land or crop land. Twenty-five percent of the soils have undeveloped or immature profiles, which limit productivity in many cases. The remaining 40 percent of the surface is so broken and mountainous as to severely limit the value of the soils found there. Sixty-two percent of the public lands fall within capability Class VI, which has relatively good soil, favorable topography, and requires only good grazing or timber management practices for continual use. Thirty-three percent of the public lands fall within Class VII, which indicates suitability to grazing, but with increasing use hazard due principally to adverse topography and shallow or unstable soils. Five percent of the public lands fall within Class VIII, with principal values for watershed and wildlife purposes.

In measuring damage from accelerated erosion, 70 percent of the public lands were in the class of "none-to-slight"; 27 percent were classed as "slight-to-moderate"; and 3 percent were classified as "moderate-to-severe".

As a logical conclusion to this study of the Upper Yellowstone sub-basin, recommendations have been made as to the most desirable form of land tenure, public or private, for future management of the public lands. This phase of the study applies however only to the 62,000 acres of vacant unreserved public domain. The remaining 72,000 acres, re-acquired by the government from private owners during the 1930's under the Bankhead-Jones Act, are segregated by terms of that act from operation of the public land laws (except for exchange), by which land transfers are normally made.

Disposition to private ownership was recommended for 33,000 acres. These isolated tracts within private holdings were found to contribute more to the local economy in private ownership.

The remaining 29,000 acres were recommended for retention in public ownership because of the multiple use values which can best support the general economy under administration by one of the federal or local government agencies.

Of growing importance is the use of public lands for recreation; they furnish a primary source of "open space" for the expanding populations. The Upper Yellowstone sub-basin is one of the surplus recreation areas of the nation, where opportunities exceed demand. Approximately 11,000 acres of the public lands recommended for retention were found to possess special recreational values.

Recommendations made in this report concerning land tenure do not constitute a final determination. An authorized administrative official of the Bureau of Land Management must pass on all land use proposals before any change in status occurs.

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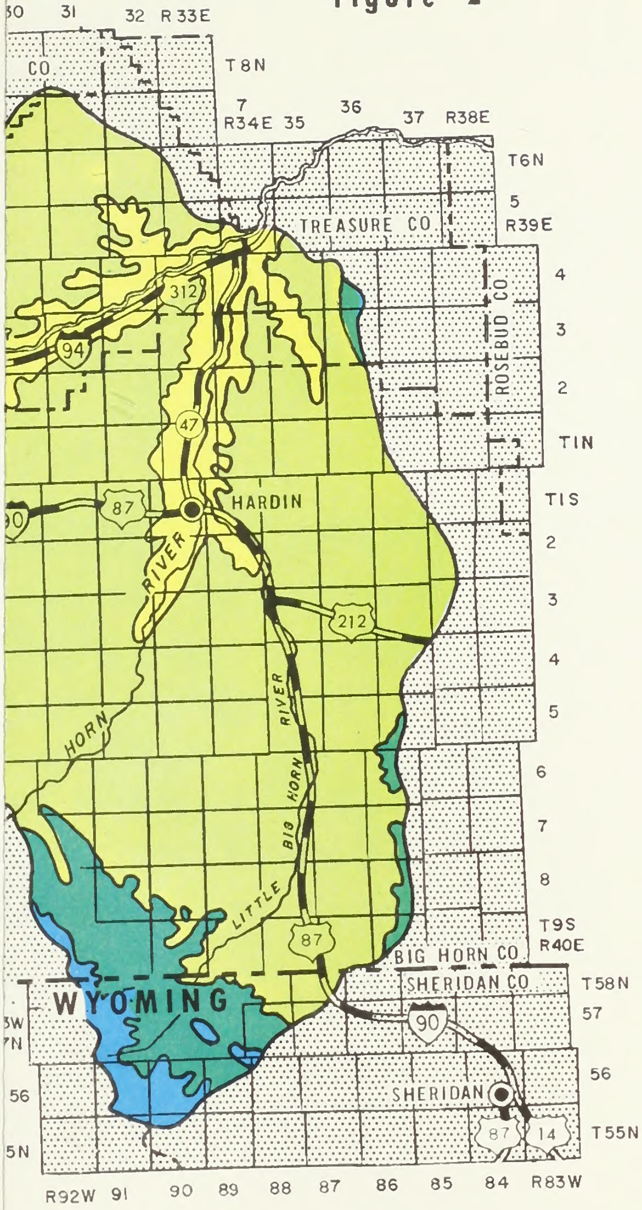

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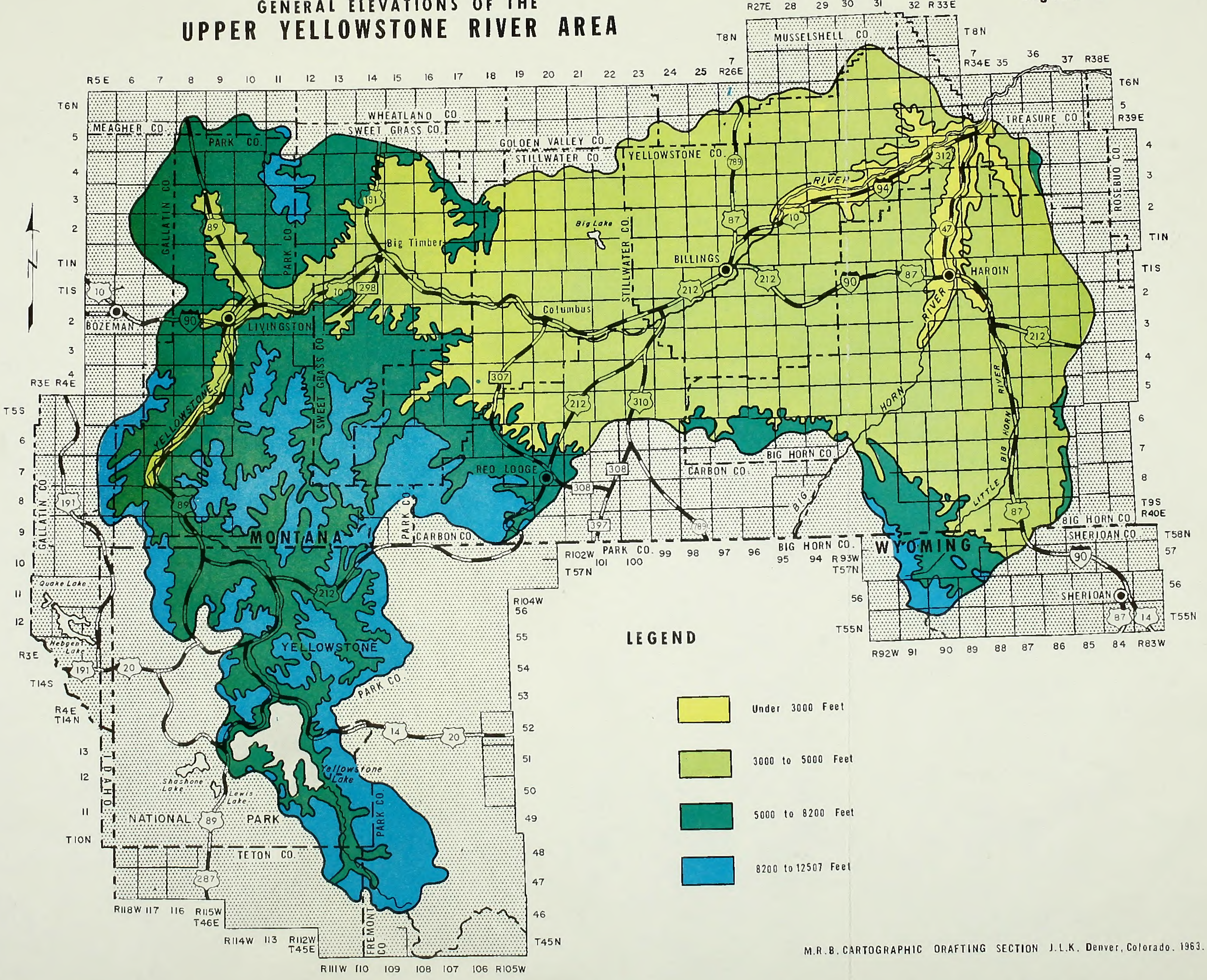
Figure 2

GENERAL ELEVATIONS OF THE UPPER YELLOWSTONE RIVER AREA



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THE UPPER YELLOWSTONE RIVER SUB-BASIN

GENERAL DESCRIPTION

Location, Size and Natural Features

The Upper Yellowstone River area, a sub-basin with a drainage of 11,433,000 acres, lies in southern Montana, in the central third of the State,against the Wyoming State line. It extends approximately 200 miles from east to west and 100 miles from north to south. The sub-basin enters the State of Wyoming at two points, once in the western end extending south through Yellowstone Park into the Absaroka Range, and again on the east end reaching south on the slopes of the Big Horn Mountains. Figure 1.

Its elevations vary from 2,800 feet at its lowest, along the Yellowstone River near the mouth of the Big Horn River, to over 12,000 feet in the Absaroka Range. The eastern end, a part of the Great Plains Province, is a level plain that slopes upward in a gentle incline to the west until it attains about 5,000 feet elevation at the base of the rugged mountains of the west, a part of the Rocky Mountain Province. Figure 2.

The Upper Yellowstone sub-basin includes 134,000 acres of public lands under the administration of the Bureau of Land Management. Sixty-two thousand acres are the range, timber, and river front lands left over when the settlers laid claim to the public domain; 72,000 acres are the re-acquired lands purchased from distressed owners during the 1930's by the Federal government under the Bankhead-Jones Act.

The basin was one of the earliest explored in the west, by Larocque in 1805, and Clark in 1806, however it did not develope until the latter part of the 19th century. The unique attractions of the upper Yellowstone Basin were guessed by Captain Raynolds, who unable to climb the plateau from the south lamented, in 1860:

> "...the valley of the Upper Yellowstone, which is, as yet, a terra incognita. My expedition...could not penetrate it...we were compelled to content ourselves with listening to marvelous tales of burning plains, immense lakes and boiling springs, without being able to verify these wonders ...Bridger, in one of his recitals, described an immense boiling system that is a perfect counterpart of the Geysers of Iceland..."

In 1872 these marvels were preserved for posterity by the creation of the first National Park.

Billings, Montana, the hub city in the sub-basin, with its strategic location relative to oil and gas production, has 80 percent of the State's petroleum refining capacity. Bituminous coal beds, at nearby Red Lodge, are of a high quality, and to the west a short distance, is a major source of a rare and important mineral, chromite.

The economic future for the Upper Yellowstone Area is bright. Recreation is the most promising for its mountainous western segment. The rich coal fields and marginal, though important, chromite mines close to the Billings-Laurel industrial complex, with its oil and gas refineries and concentration of transportation facilities, gives the eastern portion strong growth possibilities.

The Yellowstone River

The Yellowstone River, with the greatest discharge of any stream flowing into the Missouri, heads at 10,800 feet elevation in the mountains of Wyoming -- just south of the boundary of Yellowstone National Park. In the first ten miles it drops nearly 2,000 feet. It then flows on gentle gradients for approximately 60 miles through the Park's center where it forms, at 7,750 feet elevation, the 150 square-mile Yellowstone Lake, one of the higher navigable lakes in the world.

Once out of Yellowstone Lake the gradient increases slightly until in the eightieth mile, where it abruptly plunges over the spectacular Upper and Lower Falls. Below the falls, in ten miles of the Grand Canyon of the Yellowstone, the fast water drops another 1,200 feet to the northern boundary of Yellowstone National Park. At that point the stream has flowed about 130 miles and dropped over one mile. Its steep descent continues as the river pours northward through a narrow gorge until it reaches Livingston, Montana. There it turns, at roughly 4,900 feet elevation, and flows northeasterly with gentler gradients. (Figure 3.) At Billings, after a run of 300 miles, the river elevation nears 3,000 feet. The lowest point, about 2,800 feet, is reached at the mouth of the Big Horn River, 390 miles from the Yellowstone's head. The average fall of the river through the sub-basin is slightly over 20 feet per mile. 1/

1/ The Yellowstone River in its total 670 mile length has an average fall of 13.3 feet per mile.

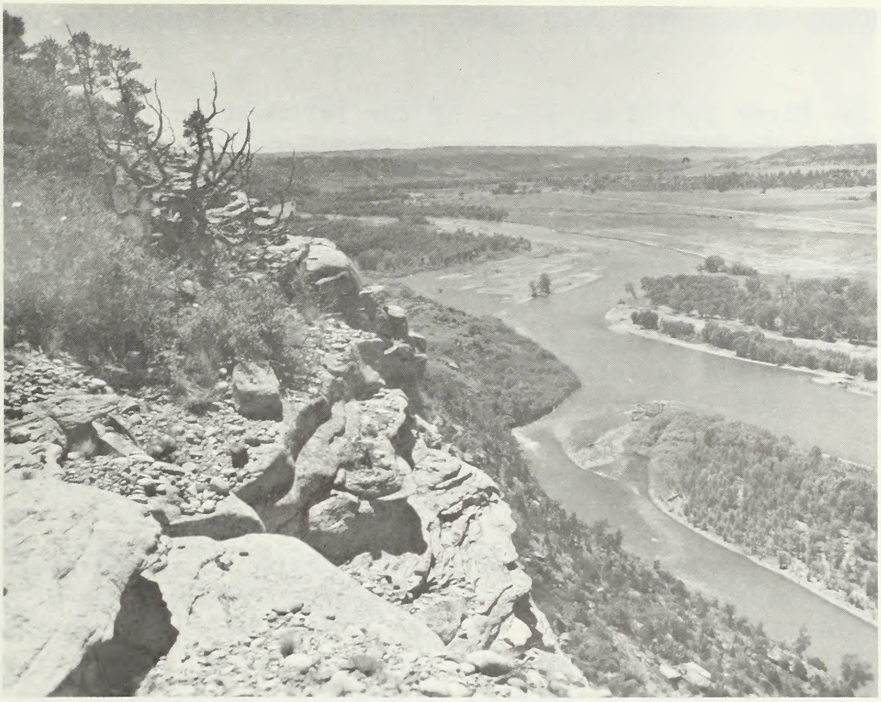


Figure 3: The Yellowstone River, originally "the Roche Jaune" was probably named by translation of the Indian name "Mitsiadasi". Long miles of seething river flow past high cliffs of yellow sandstone. Here isolated tracts of public domain command a spectacular view of the Yellowstone Valley and the Beartooth Mountains, and give access to the river.

The sediment load carried by the Yellowstone River through the Upper Yellowstone Area is relatively light until it reaches the eastern margin of the sub-basin at the mouth of the Big Horn River. Here the Big Horn, one of the two major contributors of sediment, joins the main stem. (The other main source of sediment is the Powder River, which for the brief periods that it is in flood, carries the greatest load). The Yellowstone carries the most sediment of any tributary to the Missouri, although its drainage is but 13 percent of the 530,000 square miles in the Missouri's basin. This sediment load existed before the coming of white men, for in 1805 Larocque commented on the turbid waters of the Powder:"...the current in that River is very strong and the water so muddy as to be hardly drinkable. The Indians say it is always so...". And again, "...The Powder River was so muddy the Indians were under the necessity of making [holes] in the Beach and drink the water that gathered in them..." Clark in July, 1806, noted that all the tributaries of the Yellowstone River were very muddy, the Clark's Fork being the least so.

The first 390 river miles of the Yellowstone from its origin includes hundreds of miles of bigstream fishing in Montana. This river forms about 25 percent of the class I trout streams in the State.

Despite its size, the Upper Yellowstone River has few good hydroelectric dam sites. Only one Federal irrigation project is included in the area. River boats reached upstream to Billings, but for the past 55 years sub-basin needs for communication and transportation have been met by highways, railroads and airways.

Climate

The extremes of elevation and topography, as indicated in Figure 2, creates the many climates of the Upper Yellowstone Sub-basin. Half the basin is level plains. Here the open country encourages the full sweep of its characteristic west winds. Precipitation (figure 4) averages between 10 to 20 inches, with about one-third of the plains having over 15 inches, the remainder with less. About 60 percent of the average rainfall falls during the growing season.

The mountains, as expected, have greater amounts of precipitation with from 20 to 40 inches, much of which falls as snow, and is the source of irrigation water for the valleys below. Table 1.

Table 1. UPPER YELLOWSTONE SUB-BASIN
Average Annual Precipitation

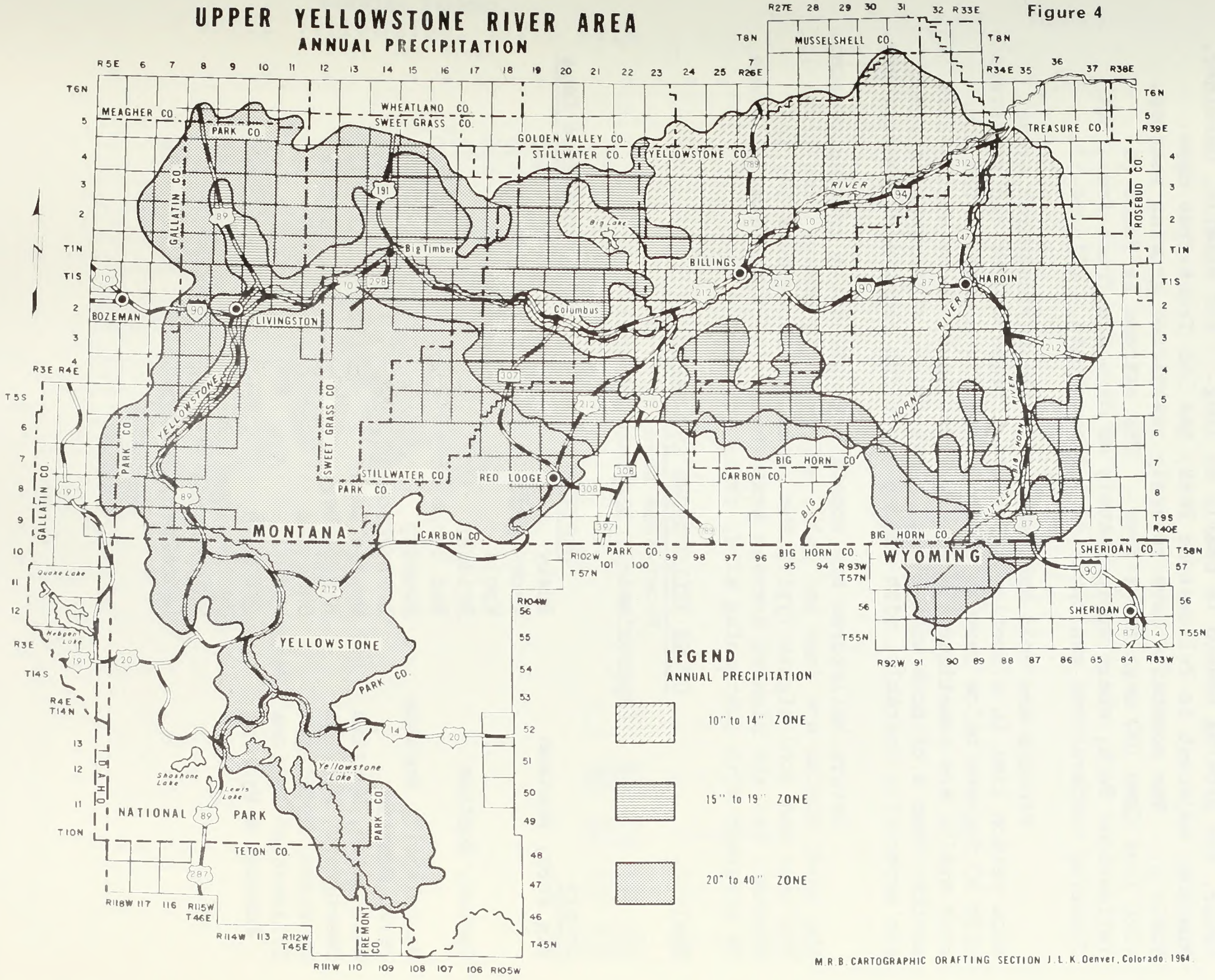
Montana

County	Station	Average Annual Precipitation
Big Horn	Busby	12.98
	Crow Agency	15.33
	Wyola	13.22
Carbon	Bridger	10.42
	Red Lodge	18.38
Park	Livingston	14.67
Stillwater	Mystic Lake	22.68
	Nye	21.55
Sweetgrass	Big Timber	14.61
Yellowstone	Ballantine	11.25
	Billings No. 2	13.41
	Huntley	13.39

Figure 4

UPPER YELLOWSTONE RIVER AREA

ANNUAL PRECIPITATION



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The growing season on the plains is from 120 to 140 days. In some mountain valleys, where fingerlike continuations of the plains occur, the growing season is nearly as long. For example, Gardiner, Montana, adjacent to Yellowstone Park, has 116 frost-free days. Table 2. The mountains have severely restricted growing seasons, with less than 100 days frost-free. The extreme is found in Yellowstone Park, where approximately 40 days are frost-free, but freezing temperatures can occur during any month. (Figure 5).

Winters are cold and open. In the agricultural areas snow seldom lies in a continuous cover. Temperatures can be severe with 50 degrees below zero expected in any given year. The long cold spells are sometimes dramatically broken by balmy spring-like weather when a chinook wind blows. Late fall, winter, and spring are especially unstable, with sudden startling changes of temperature.

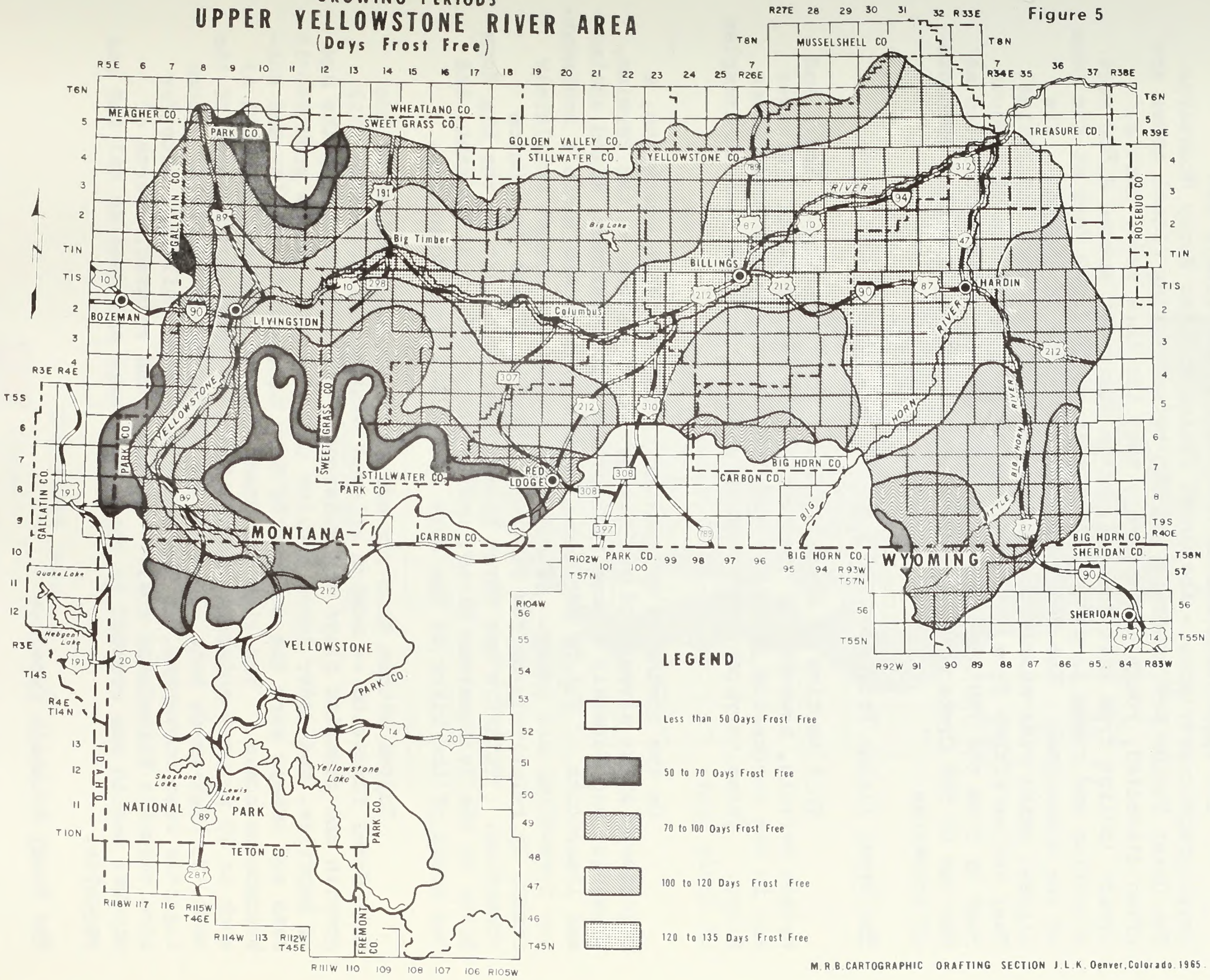
Severe hailstorms are common throughout the growing season; the worst months are June and July, and property damage runs high. Hot days and cool nights typify the summer. The sub-basin, in Montana, has the highest average temperature for the State. Autumn is pleasant with continuing mild, crisp weather.

Table 2. UPPER YELLOWSTONE SUB-BASIN
Frost-Free Days
(Approximately 30 years record)

County	Station	Frost-Free Days
Big Horn, Montana	Busby	115
	Crow Agency	135
	Wyola	126
Carbon, Montana	Bridger	123
	Red Lodge	100
Musselshell, Montana	Roundup	141
Park, Montana	Livingston	127
Stillwater, Montana	Mystic Lake	117
Sweetgrass, Montana	Big Timber	123
Sheridan, Wyoming	Sheridan	130
Yellowstone National Park Montana & Wyoming	Gallatin	35
	Yellowstone Lake	47
	Yellowstone Park Hq (Gardiner, Montana)	116

Figure 5

GROWING PERIODS
UPPER YELLOWSTONE RIVER AREA
(Days Frost Free)



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Geology

The Upper Yellowstone River Area lies within two physiographic provinces - the Great Plains and the Rocky Mountains. The Great Plains are generally smooth to undulating (local areas are often dissected, rough and broken); they lie in a vast, gentle, upward incline from east to west, which starts at around 2,800 feet elevation and comes to an abrupt halt at about 5,000 feet at the base of the mountains. The Rocky Mountain Province is rugged. Its highest peaks rise nearly one and one-half miles above the plains. They derive either from intrusions of stupendous masses of igneous rock or from the faulting and uplifts of the Laramide Revolution at the end of the Cretaceous period or - uncommonly - isolated remnants of volcanoes.

The Great Plains Province

This section is normally level to undulating. Rough and broken terrain, however, is frequently encountered along drainages and in the succession of bluffs and terraces along the Yellowstone River. These terraces are cited in geology texts as classic examples of their type.

On the northward extensions of the Big Horn Mountains, a relatively minor acreage of earlier geologic periods -- the Permian, Triassic, and Jurassic -- are represented by sandstones, mixed shales and limestones. But by far the greatest part of the basin's sedimentary formations are young. (Figure 6.) They lie almost completely rimmed by relatively narrow Tertiary deposits of the Fort Union formation. This rim has three breaks; one just west of the Big Horn River on the Yellowstone River, one north of Columbus, Montana, and one south of the river at the base of the Big Horn Mountains.

Cupped within this rim are the Cretaceous shales of the Hell Creek formation -- sombre colored sandstone interbedded with greyish and greenish clays and mudstone -- all formed during the Age of Reptiles, and under large shallow inland seas. These prehistoric seas and swamps were the origins of huge tonnages of lignite and subbituminous coals. The lignites grade from poor, sometimes with as much as 40 percent moisture, in the Tertiary (Fort Union) beds of the east, to high-grade beds close to the mountains of the west. Some lignites were converted, in the era of mountain building, into far more valuable bituminous coal. Another, and related, source of mineral wealth was created in the same swamps and seas as oil and gas deposits.

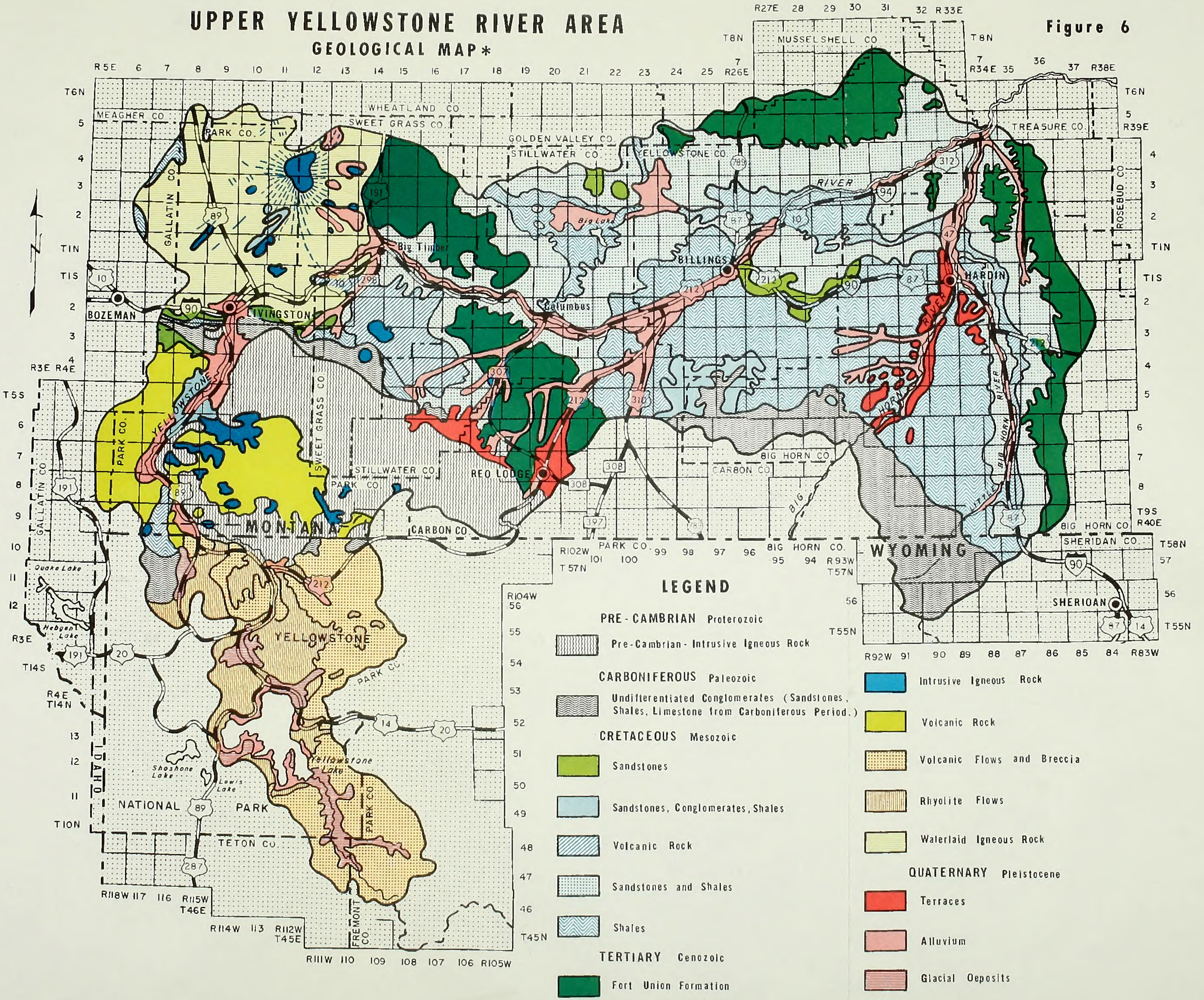
The Rocky Mountain Province

In the Rocky Mountain Province elevations vary from approximately 5,000 feet at the base of the mountains, to over 11,000

Figure 6

UPPER YELLOWSTONE RIVER AREA

GEOLOGICAL MAP*



* Based on Geological Map of Montana by U.S. Geological Survey - 1955.

M.R.B. CARTOGRAPHIC DRAFTING SECTION J.L.K. Denver, Colorado. 1963.

feet in isolated volcanic peaks of the Crazy Mountains, and higher, above 12,000 feet, in the series of glacier-sculptured peaks of the Absaroka Mountains.

Approximately one-third of the Province, the backbone of the Absaroka Range, is one geologic structure, a monolithic ancient granite formed in Pre-Cambrian time by molten parent material intruding into country rock and then cooling in place. At the surface it totals nearly one million acres, the only major single geologic formation in the entire sub-basin formed earlier than the Cretaceous period. The eastern front is a vast geologic fault extending scores of miles as a remnant of the mountain building of the Laramide Revolution. Minor acreages of the Carboniferous, combined and undifferentiated, are to be found in the Big Horn Mountains.

North of the Yellowstone Park, approximately half of the exposed rock is water-laid, reworked, volcanic material. Volcanic flows or isolated granite stocks (with an origin like the Absaroka Range) as much as thirty thousand acres in extent, or as mile upon mile of intrusive granite dikes and sills,make up the remainder.

The Cretaceous shales of the valleys are intermixed with very recent Quaternary deposits of sand and alluvium.

The Yellowstone River heads at 10,800 feet in recent volcanic deposits. Approximately 30 percent of the surrounding high (8,000 feet) plateau, which includes most of Yellowstone Park, is made up of volcanic breccia; another 30 percent consists of rhyolite flows and the remainder is basalt.

Soils

Forty percent of the Upper Yellowstone River Area is too broken or too mountainous for soils to be mapped. Steep, barren rock outcrops and very shallow soils with near-exposure of rock at the surface occur in the mountains of the west and on the rough, broken land of the plains, especially along the lines of the river terraces. These excessively stony to barren rock outcrops are often interspersed with soil pockets and benches. Above timber-line, in the mountains, alpine soils are formed in a severe climate of high winds, deep snows over permanently frozen sub-strata. Alpine soils are shallow, not usually over 12 inches deep and high in organic matter; more favorable sites may form meadow soils of shallow to moderate depth, with a high organic matter content. Vegetation is low growing, usually as grass or grass-like plants amid the rock outcrops. Forage is utilized principally by wildlife.

From timberline the coniferous forests extend far down the cool, moist, north slopes. Here podzolic soils of low fertility develope. These have heavily leached "A" horizons with a strong cementation below in the "B" horizons. Similar but more fertile gray-brown forest soils are intermixed on gentler slopes or in locations of warmer temperature. Podzolic soils produce timber, wildlife cover, and limited wildlife forage, and are very important in their watershed influence.

Thirty-five percent of the sub-basin is covered by soils with either a good potential for high-producing grassland or as cropland. These soils are fertile, light-brown to dark-brown, with a gravelly profile and depths ranging from shallow to moderately deep. They are developed where precipitation is relatively high but still so limited as to be capable only of supporting grasses in their natural state. The development of this soil is strongly affected by these limitations and result in a productive soil. The deeper soils of this group are usually under cultivation.

The remaining soils of the basin, 25 percent, have undeveloped or immature profiles. Some are highly productive such as the alluvial soils of the valleys. These are usually deep and under irrigation. Others, usually found in the drier zones in the plains, have undeveloped profiles, because of an excess of salts. Saline soils are commonly structureless but this varies with the amount of salts originally present and the degrees of leaching. Use is usually restricted to native forage plants; productivity varies from low, on barren sterile soils, to very high on sub-irrigated native meadow.

Vegetation

Historical

The basin was an unspoiled wilderness for many years. Its' vivid accurate descriptions come to us in detailed journals from 1805 until 1863; trappers, miners, explorers and topographic engineers of the United States Army all made their contributions.

Francois Antoine Larocque, in 1805, traveled overland southward from the Missouri River and crossed several of the southern tributaries of the Yellowstone River turning northward to the site of present-day Billings. He returned east along the Yellowstone River. Clark in 1806, initially overland and later by water, and James Stuart in 1863, overland, traversed the east-west axis of the Upper Yellowstone Area. Figure 7. Captain Raynolds in 1859, overland, covered the Upper Yellowstone River Area from the mouth of the Big Horn River, south. The following spring, in 1860, Lt Maynadier of the Raynolds party re-entered the area from the south at the Clark's Fork River, traveled overland westward to a rendezvous at the Three Forks with Raynolds; he then returned to the Yellowstone River and retraced, by canoe, Clark's route. [1]

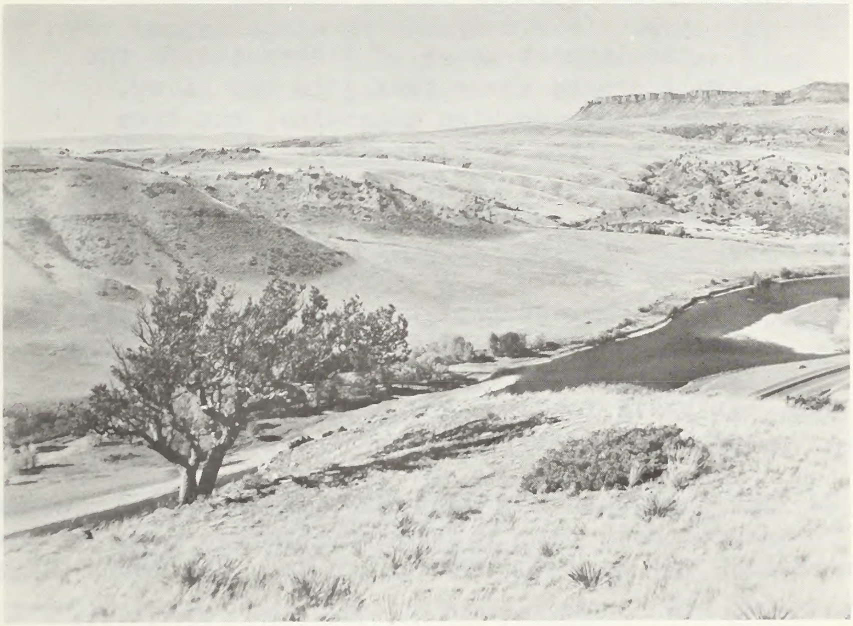


Figure 7: In the upper valley of the Yellowstone River Clark, 1806 and Stuart, 1863 traveled overland on the far shore. Maynadier floated the river in the "Rose of Cashmere"- a hide boat with a strong odor. Today railroads and highways follow along the river's course.

Clark entered the Upper Yellowstone Valley in mid-July 1806. On the broad valley of the Shields River, on July 18th, Clark states: "...I halted in a bottom of fine grass to let the horses graze..."on that day too he found dense stands of prickly pears, noting: "...Country rugged and stoney emmence qtty of prickly pears..." On the 23rd of April, 1863, four miles above the Shields River mouth Stuart wrote:

> "...since leaving Beaver Head we have seen but very few prickly pears until this afternoon, when we found plenty and of the largest size..."

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[1] A short account of each expedition is given in Appendix D. Figure 33 is a map showing the routes.

Stuart's party traveled along the Yellowstone River banks and on the 25th of April, 1863, he recorded the first prairie-dog towns (quotes on this town are under the section on Wildlife). Near Big Timber, he wrote:

> "...the largest grove of timber are on the small creeks where they join the river, some timber on high mountains, but from here it seems to be scrubby..."

The rangeland of 100 years ago on the 26th of April, 1863 was described as:

> "...the character of the soil and rock is the same as yesterday, only there are more prickly pears; very miry, bad travelling... splendid feed for our horses...saw plenty of grama grass since yesterday morning...

We find then that 100 years ago, in an era of presumed plentiful forage, not only prickly pear and prairie-dogs but grasshoppers prevailed, for near Big Timber, on July 19, 1806, Clark commented:

> "...it may be proper to observe the emence Swarms of Grasshoppers have distroyed every sprig of Grass for maney miles on this side of the river and appear to be progressing downstream...found some large timber near which the grass was tolerably good..."

On the 26th of April, 1863, Stuart, in the same locality, added to his observations of soil and forage this comment:

> "...the ground is almost covered with young grasshoppers. We can neither cook nor eat without having the game seasoned with them. If they all live to become full grown, they will devour all the grass, and our horses will have hard times as we return. One kind of the cottonwoods are beginning to leaf out, and so are the cherry and gooseberry bushes..."

In 1806, Clark had written:

> "...the plains are butiful and leavel but the soils but Thin Stoney and in maney parts of the plains and bottoms there are great quantities of prickly pears..."

Of this same locality, 57 years later, on the 27th April, 1863, Stuart wrote:

> "...the surface of the country has entirely changed again in todays travel. The clay still remains but there is a different kind of sandstone, and there is more gravel on the hills. On both sides of the river the low hills are now thinly covered with yellow pine and cedar; there is also more cottonwood along the river and creeks...and plenty of wolves, prairie-dogs and prickly pears..."

Stuart, on the 28th April, near the present site of Columbus:

> "...the river bottoms here average about two miles. The cottonwood timber is not as good as yesterday, but there is more scrubby yellow pine and cedar on the hills. Along here the timber only extends from one to ten miles back from the river on both sides..."

In this vicinity Clark lost some of his horses. His reasoning as to why they were stolen by Indians and had not strayed gives us an insight on the forage of the upland range of that day:

> "...22 July, 1806 my suspicions is grounded on the improbability of the horses leaving the grass and rushes of the river bottoms of which they are very fond, and taking immediately out into the open dry plains where the grass is but short and dry..."

Of the Clark's Fork River on July 14, 1860, Maynadier noted: "...Its waters being turbid, produces a slight discoloration in that of the Yellowstone..." Three miles below the mouth of the Clark's Fork (between the present sites of Laurel and Billings, Montana) Stuart in 1863 wrote:

> "...traveled all day down a valley between terraced tablelands and buttes; valley about eight miles wide...plenty of buffalo grass here;...No timber except cottonwood, and that very scrubby...The ground is literally covered with young crickets, between them and the grasshoppers I am afraid the grass will soon be used up..."

Maynadier on July 15, 1860, below here and near the site of present-day Billings, made his painful acquaintance with brittle prickly pear, the less common of the two species of prickly pear in the sub-basin:

> "...After a few miles in the bottom the road ascended the hills and passed over a level table-land covered with a species of prickly pear, consisting of small balls covered with thorns, which caused great distress to the poor animals. The little torments really seemed to have the power to leap from their stems and stick to some luckless mule, whose outrageous kicking and plunging was the only sign of mischief..."

The following day, on July 16, just upstream from Pompey's Pillar, Maynadier comments:

> "...I therefore came in the boat to sound the river, and was surprised to find a continuous channel with 6 feet at the shallowest and 20 in the deep places. Along the right bank there was a bluff 60 feet high and covered with pine. On the left there were fine valleys in each bend, and immense herds of buffalos were feeding in them and in the cottonwood groves of the islands..."

Just to the east, at the mouth of the Big Horn River, Maynadier's party, led by Captain Raynolds, had turned south in the previous fall to ride up the valley of the Big Horn. On September 5, 1859, Raynolds commented, during that trip, on sagebrush and forage with:

> "...After again reaching the valley, search was at once commenced for a camping ground, but the scarcity of grass compelled us to travel three or four miles further before halting. We at last selected a spot upon the river, furnishing on the low ground scanty pasturage for our animals, which we were compelled, however, to eke out with the bark of young cottonwood trees. Artemisia covered the ground over which we have travelled today, seriously inconveniencing the progress of our vehicles. This and the hills that we were compelled to cross, as mentioned above, were all, however, that marred the excellence of the road..."

The next day he continued:

> "...About three miles from camp we entered a wide, open valley, perfectly level, but travelling still embarrassed by the artemisia..."

At noon they halted at a stream with"...three great requisites for camping, wood, water and grass..."

On September 7, Raynolds wrote:

> "...On the east bank we found fine grass, the best seen this season, but it does not extend over one-fourth of a mile from the river, the balance of the valley being clay covered with the interminable artemisia. Old corrals and the remains of lodges show that this is a favorite resort of the Indians..."

And on September 8:

> "...We continued up the valley of the Big Horn, and for the first nine miles over as fine a road as could be desired, being almost level and with very little sage to obstruct our progress..."

Fifty-four years earlier and reflecting some of the conditions of the Yellowstone River Basin further east, Larocque in July 1805, comments on the soils and vegetation of another tributary of the Yellowstone River -- the Powder River:

> "...Fryday 26th. We passed through a Range of hills whose tops and sides are covered with pine, and at the foot are many small creeks well wooded with Ash Maple, there are plenty of different kinds of mint which emit a very odoriferent smell...The course we have pursued on a very barren soil for 22 miles was West..."

> "...Saturday 27th. We arrived at noon at the Powder River after 6 hours ride by course West by South for about 20 miles...It is amazing how very barren the ground is between this and the lesser Missouri, nothing can hardly be seen but those Corne de Racquetts (prickly pear cactus). Our horses are nearly starved. There is grass in the woods but none on the plains which by the by might with more propriety be called hills, for

> "though there is very little wood, it is impossible to find a level spot of one, or two miles in extent except close to the River..."

Discussion

Larocque's, Clark's, Maynadier's and Stuart's emphasis on the commonness of prickly pear cactus indicates that much of the prickly pear of today is in normal amounts. Forage sufficient for the horses was often limited, except close to the river and even then abundant forage is linked, often in the same paragraph, with the prevalence of prickly pear cactus. Sagebrush must have been common throughout the lower sub-basin, Raynolds is, however, the only one of the overland travelers who comments on its continuous area and its great quantity. Stuart, also leading his party overland had serious Indian trouble in this part of his journey and sagebrush was probably the least of his concern.

Prairie-dog towns are often cited as an indicator of today's misuse of the range. However, most early explorers frequently described them in this era of presumed plentiful forage. Prairie-dog towns, as wide as two miles, were encountered on the North Platte in 1812 (Robert Stuart) and commonly on the South Platte in 1820 (Long). Many prairie-dog towns several miles in extent were found farther south and east on the Platte in 1842 (Fremont). Clark and Maynadier, with most of their trip on the river, made no comments on prairie-dog towns. Stuart traveling by horse, mentions their presence often.

Clark and Stuart both reported destructive numbers of grasshoppers in the upper part of the valley, and crickets and grasshoppers downstream. Throughout the west insects were often seen in large numbers. In 1838, on the North Platte, "...The grasshoppers resembled a green stream flowing down the valley..." Large numbers of grasshoppers and crickets were not unusual and probably represent reaction to climatic rather than range conditions.

Modern Vegetation

The mountains are timbered -- lodgepole pine, Douglasfir, Engelmann spruce, limber pine and ponderosa pine cover the slopes; sites of old burns may be marked with aspen. The valleys commonly have cottonwoods or aspen. Timber is found on the plains along the shallow-soiled rocky ridges; it is usually non-commercial except for a few isolated high-plateau stands. Lodgepole pine and Douglasfir are the principal lumber producers of the mountains whereas ponderosa pine is the lumber producer of the plains. Cottonwoods and aspens are secondary species usually of non-commercial value.

Approximately half of the public lands of the Bureau of Land Management have some trees as a part of the plant cover.

Rangeland conditions have varied remarkably little since the early days of exploration if we judge from reliable early accounts. Today, as then, grasses dominate the range of the sub-basin. Bluestem wheatgrass, needleandthread, bearded bluebunch wheatgrass,green needlegrass, Sandberg bluegrass, and prairie junegrass are the most common grass species. Inland saltgrass and alkali sacaton are usually found on saline flats; rocky slopes have little bluestem, sideoats grama and often prairie sandreed. Sagebrush, especially big sagebrush, is the most important browse species; occasionally isolated patches of silver sagebrush assume a local importance on the lowlands. Serviceberry, chokecherry, mountain mahogany, aspen, snowberry, skunkbrush, greasewood, wildrose, and willows are common, influenced by topography or soils they concentrate in limited stands. All of these shrubs are grazed by domestic livestock and game. Junipers are common browse species of significant value to wildlife, especially deer.

Annual grasses increase and decrease from year to year by as much as 1000 percent. Even in the relict areas, where livestock are excluded, at Square Butte, near Laurel, and Pompey's Pillar, the plant cover is composed of five to ten percent annual grasses, either downy chess or Japanese brome. These grasses and eight-week fescue are the sub-basin's most common annual grasses.

Large concentrations of poisonous plants are rare in the basin. Arrowgrass and chokecherry are the more important species. The quick deadliness of arrowgrass makes even its smallest patches a detriment to the range. Chokecherry, under certain circumstances, can cause poisoning but it is commonly a valued forage plant.

Prickly pear cactuses are still growing in the same areas emphasized by the notes of the early explorers.

Green and fringed sagebrush are plants common in the basin on range with prolonged overuse. Since the time of the early explorations, smooth brome, Kentucky bluegrass and crested wheatgrass have been introduced. These plants are of value as forage and often become naturalized.

Wildlife

The change in wildlife,[1] as compared to those changes in the plant cover were drastic. Captain Raynolds in 1859, confronted with the great buffalo herds of the sub-basin, predicted their quick end.

> "...When my party first reached the bluff overlooking the Yellowstone, the sight was one which in a few years, will have passed away forever. I estimated that about 15 miles in length of the wide valley was in view. This entire tract of 40 or 50 square miles was covered with buffalo as thickly as in former days, in the west (when cattle were driven to an eastern market), a pasture field would be which was intended only to furnish subsistance to a large drove for a single night..."

Clark in 1806, on climbing the divide between the headwaters of the Missouri and the Yellowstone Rivers, counted numerous elk. They killed a grizzly bear that evening at camp. Stuart, 21 April, 1863, followed Clark's route. His encounter with wildlife had a coincidence in that as he ascended the Yellowstone divide 100 elk filed by, before camping they too killed a grizzly bear.

On the 15th of July, 1806, Clark records many beaver dams (not mentioned by Stuart in 1863) which made going slow. Maynadier in 1860, 22 miles to the east of Stuart, most probably on Timber Creek, remarked, "...For two or three miles the route lay on a stream filled with beaver dams and spread out by them into quite a lake..."

On July 6, in 1806, Clark comments:

> "...Saw a large gangue of 200 elk and nearly as many antilop also two white and Gray Bear in the plains...saw emence herds of Elk feeding on opposit sides of the river..."

1/ Reports on the wildlife are from the same sources as those for vegetation: Larocque 1805, Clark 1806, Raynolds 1859, Maynadier 1860, and Stuart 1863.

And on July 17th: "...Buffalow is getting much more plenty than they were above not so many Elk and more deer..."

In 1863, Stuart's party, on the valley of the Shields River, recorded that fresh buffalo signs were common, many elk, antelope, and three white-tailed deer were sighted on the tableland east of the river.

Stuart's party leaving the valley of the Shields traveled three miles from and parallel to the course of the Yellowstone until the 25th April, 1863, when they moved onto its banks. That day two bands of elk and some antelope were seen. Stuart killed a white-tailed deer and encountered the first prairie-dog town of the trip with this pleasantly personal note:

> "...saw many prairie-dog towns today for the first time on the trip. Such great big fat 'critters' running all over town barking bloody murder, and their companions, little diminutive owls, sitting on the largest houses and viewing the hubbub with looks of greatest gravity and wisdom. It made me feel good to see them enjoying the excitement of strangers going through town..."

Stuart on 27th April, 1863, near Big Timber, recorded:

> "...saw a small band of bighorn or mountain sheep for the first time on the trip; also a few antelope and plenty of wolves, prairie-dogs, and prickly pears..."

But on the 28th April, he saw a total of only three antelope and four elk and worried about the game getting very scarce ! Fishing, however, was still good; anyone who would take grashoppers for bait and go fishing could catch an abundance of whitefish. (For some reason the Yellowstone River was assumed to be devoid of trout at this time).

On the 21st of July, 1806, near the present site of Columbus, Clark commented: "...A Great number of Geese which raise their young on this river passed down frequently since my arrival at this place..."

Downstream on the 24th July, 1806, near the present site of Billings, Clark saw:

> "...emence number of deer, Elk and buffalow on the banks. Some beaver. For me to mention or give and estimate of the different species of wild animals on this river particularly Buffalow, Elk, Antilopes,and Wolves, would be incredible. I shall therefore be silent on the subject further..."

Below Laurel on 30th April, 1863, Stuart, three miles below the mouth of the Clark's Fork noted: "...many elk and some antelope in the valley; saw two bighorn rams on a high cliff by the river...plenty of geese and ducks along the river. ."

Fifty-four years later, July 16, 1860, and further east, Maynadier observed:

> "...On the left there were fine valleys in each bend, and immense herds of buffalos were feeding in them and in the cottonwood groves of the islands..."

Of that same area on May 1, 1863, Stuart wrote:

> "...There are many groves of large cottonwoods, elk and buffalo were plenty and along the river were many houses some built like lodges, most of them oblong or square..."

Clark on the 25th July, 1806; "...saw a large gangue of Buffalow on the land bank..." He climbed Pompey's Pillar (figure 8) to find a:

> "...delightfull prospect of the extensive country around and the emence herds of Buffalow, Elk and Wolves in which it abounded, I descended and proceeded on a few miles... saw a gangue of about 40 Big Horn animals fired at them and killed 2 on the side of the rocks whcih we did not get. I directed the canoes to land and I walked up through a crevice in the rocks almost inacessiable and killed 2 of these animals one a large doe the other a yearling buck..."

On the 27th July, 1806, Clark camped on an island[1] at the mouth of the Big Horn and in red paint put his name on a cottonwood, here:

> "...The Buffalow and Elk is astonishing numerous on the banks of the river on either side, particularly the elk which lay at almost every point in large gangs...The Buffalow are Generally at greater distance from the river and been a continueing bellow in every direction, much more beaver sign...I saw several of these animals. Bighorn sheep on the bank today. The antilopes are scarce as also the bighorns and the deer are by no means so plenty as they were near the Rocky Mountains..."

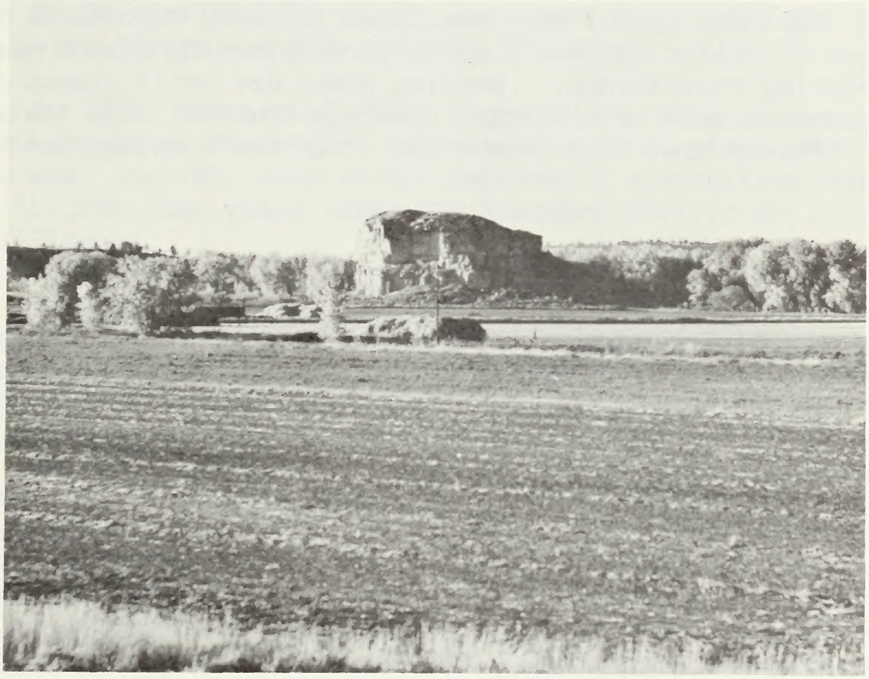

Figure 8: The rock of "Pompey's Pillar" rises above the level flood plain immediately south of the Yellowstone River. It is a conspicuous landmark. September 15, 1805, Larocque described it as "...a Whiteish perpendicular Rock on which is painted with Red earth a battle between three persons on horseback and 3 on foot..." Clark returning east by canoe described the wildlife from its summit. He scribed in the rock: "W. Clark July 25,1806"

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[1] Now a recreational site preserved by the Bureau of Land Management

Not far distant from the location of the last two quotes, but on the Powder River, Larocque stated on July 27, 1805:

> "...When we arrived here the plains on the western side of the river were covered with Buffaloes and the bottoms full of Elk and Jumping Deers and Bears which last are mostly yellow and very fierce..."

The shift of present day big game concentrations are better visualized by reference to the hunting areas of figure 23. The buffalo and grizzlies, the elk herds, the black bear, and the bighorn sheep have all been forced from the plains. Antelope and deer, however, still survive in large numbers.

The only upland game mentioned in early reports is the sage grouse ("prairie chicken") which is maintaining itself through careful hunting regulations. Nesting geese are still common on the river downstream east of Billings, upstream from Billings their numbers are few. Beaver are still common and often are a nuisance to irrigators.

HISTORY

Within 160 years the Upper Yellowstone Area has changed from a wilderness to a sophisticated agricultural-industrial complex. (Even as late as 1859 Captain Raynolds had estimated in a 50 square mile part of the valley the buffalo were there by the hundreds of thousands).

Changes were already under way when the first white men, the Verendryes, crossed the basin in the mid-1700's; at that time the Crow Indians had penetrated westward as far as the mouth of the Big Horn River; and by 1800 they had displaced the Shoshone throughout the entire sub-basin. In 1805 the Northwest Fur Company fearful of the American exploration westward, sent Larocque into the Upper Yellowstone Basin to meet with the Indians and teach them how to trap and care for fur pelts.

At the mouth of the Big Horn River a trading post, "Fort Lisa" was built in 1807 and abandoned in 1808. Fur trading posts in the Yellowstone area were not overly successful, and by the 1820's most trappers sold their furs at an annual rendezvous. The Yellowstone Basin was a favorite trapping ground; surprisingly only one rendezvous was held there, on the Powder River in 1831.

The recreational importance of the Upper Basin Area was recognized early in American history -- soon after the Civil War.

The Upper Yellowstone sub-basin is the site of the first United States National Park. This park was created by Act of Congress in 1872 as a result of the 1871 exploration by Dr. Hayden. Hayden, a geologist, in 1860 accompanied Captain Raynolds' expedition which failed in its attempts to enter the Yellowstone Plateau from the Wyoming side. The Washburne-Doane Expedition of 1870 coming up the Yellowstone River received the official credit for the "discovery".

Congress maintained its interest in the sub-basin; for in the next year, 1873, investigations were reported on the feasibility of irrigation.

At the same time, close to but outside the basin, gold miners had illegally invaded the Indian treaty lands of the Black Hills. The Sioux attacked and the fighting spread north and west. One encounter within the basin came in 1876 at the Battle of the Little Big Horn wherein General Custer and 250 soldiers perished.

In 1874, commercial river boats began carrying cargo and passengers upriver as far as the present site of Billings, Montana; they could not, however, survive the railroad's competition and were abandoned in 1884, two years after the Northern Pacific Railroad reached Billings.

By now the southern herd of buffalo, of four million head, were gone; the last of the northern herd, of one and a half million head, were to die under the guns of hide hunters by the year the railroad reached Billings.

The buffalo gone, the Indians could no longer live off the land. They starved. The Federal government contracted with cattlemen to supply beef to the Indians. This created a new cattle market close at hand. Cattle numbers increased, the grass from unusually favorable rainy years further inflated their numbers. Then in 1884 a drought began and in 1885 President Cleveland ordered over one-quarter million trespass cattle off the Indian reservations onto lands already growing short of feed. The drought continued through 1886 on into the worst winter the cattlemen had seen. By spring of 1887 the cattle industry was almost wiped out. This tragedy was recorded by the artist Charles M. Russell, in his dramatic paintings the "Last of the Five Thousand" and "Waiting for a Chinook". In the years that followed, the farm-based livestock operation replaced the year long use of the range. Harvesting of forage for winter feed opened the way for the livestock industry to develope into a stable enterprise.

Mining, one of the mainstays of the Upper Yellowstone Basin, started at Cooke City, in what was to prove short-lived gold strikes. Richer diggings at Emigrant were the initial reason for the founding of the town of Livingston in 1881. The town was to expand with the coming of the railroad in 1883 to become one of the more important cities in the area.

In the meantime, dryland farming had developed, apart from the interest in irrigation. High prices during World War I caused the breaking up of thousands of acres of land, which were later abandoned due to low prices. These abandoned lands were subsequently rebroken, and farmed with thousands of additional acres until the depression of 1929,and a series of severe drought years, created chaos for dryland farmers. A large portion of their lands were sub-marginal farming lands and during the 1930's was purchased by the Federal government under the terms of the Bankhead-Jones Act. This land was returned to permanent vegetation and is now managed by the Bureau of Land Management.

The stable economy of the basin developed with the coming of the railroad. The coal mines, an important source of fuel, expanded and flourished. Then as coal substitutes were found in petroleum, the importance of the mines dwindled, to be replaced by the present petroleum industry of the sub-basin. Billings, founded by the railroad, became the hub of the oil-refinery system for the State of Montana.

ECONOMIC AND SOCIAL DEVELOPMENT

Population Development and Trends

The basic resource of a river basin is its human population. For the decade 1950-1960 the Upper Yellowstone River Area had the greatest increase in population (Yellowstone County) and the greatest decrease in population (Carbon County) for the State of Montana.

Carbon County had a population loss of 18.8 percent in the decade between 1950 and 1960. Its county seat, Red Lodge, one of the older Montana cities, had the greatest percentage decrease in the entire State. An adjoining county, Yellowstone, with the county seat at Billings, led the State with an increase of 41.4 percent. Otherwise in the Upper Yellowstone River Basin the variance between the counties of Big Horn, Carbon, Sweetgrass, Meagher, and Musselshell, in persons per square mile, is small. Meagher had the lightest density, one person per square mile; Yellowstone County had 29.7 per square mile.

Rural population has declined 17 percent in the plains counties, which make up the greater part of the Upper Yellowstone River Area. In the mountain counties the reverse is true, there the rural population has increased 12 percent. Geography is a clue to these trends; the mountain counties have the greatest outdoor potential because of recreation and recreational facilities. The decrease in the population of the plains counties is part of an established trend in the agricultural pattern of life. In the last 30 years, farms have steadily increased in size, and decreased in number. The cost of private services to those people still residing on the agricultural land is increasing. Farm people have moved from the small uneconomic farms to seek wages in the city, or they have relocated their homes into nearby cities.

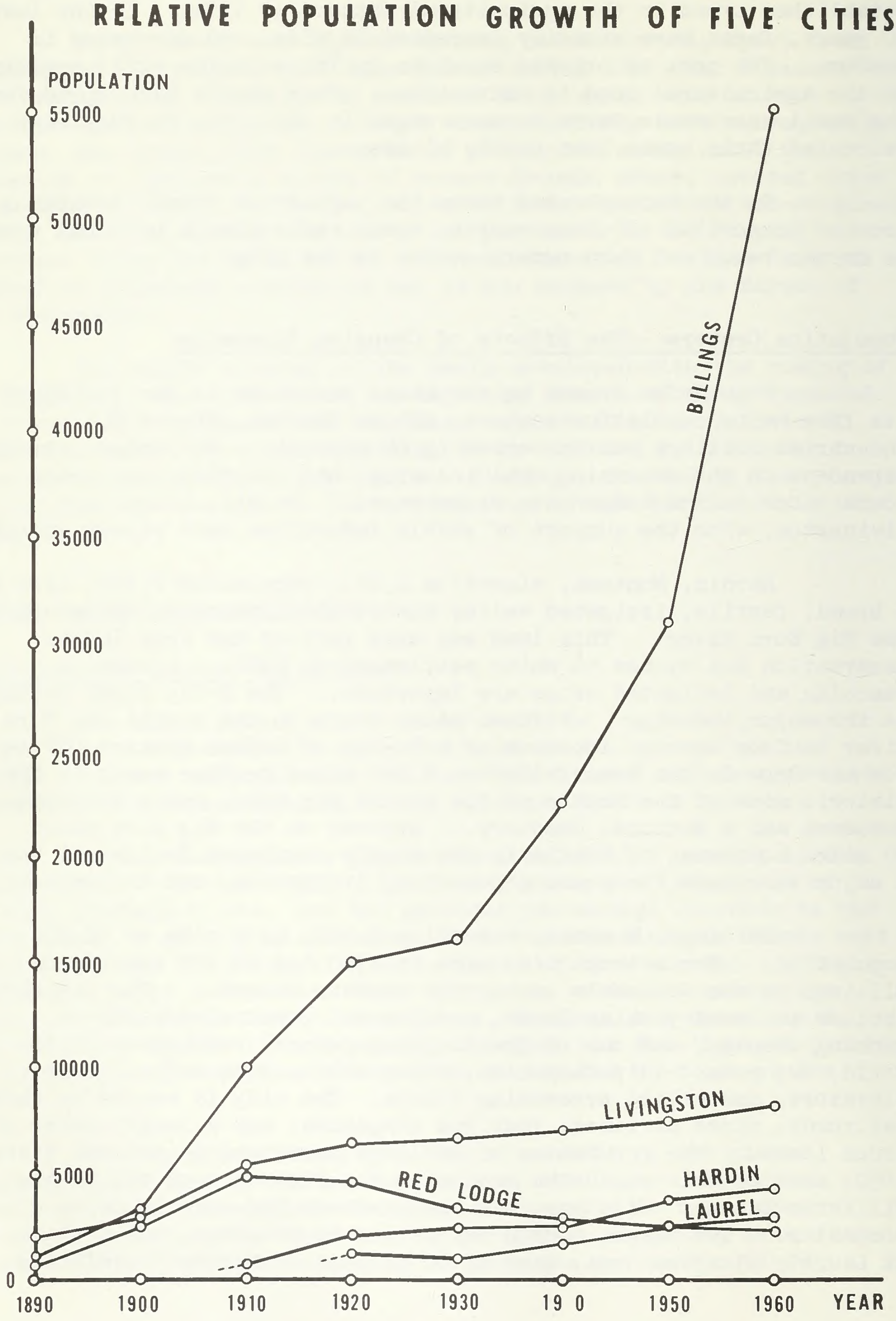
In the incorporated towns the population trends towards a greater proportion of older people, again reflecting a national trend, as former ranch and farm owners retire to the city.

Population Centers - The Effects of Changing Economics

Population trends in the basin are shown in the growth of its five major population centers, all in Montana, figure 9. Industrial Billings has increased by 64 percent. Red Lodge, strongly dependent on the declining coal industry, has dwindled, and small towns close to Red Lodge have disappeared. Hardin, Laurel and Livingston, with the support of stable industries show steady growth.

Hardin, Montana, elevation 2,911, population 2,789, lies in a broad, fertile, irrigated valley almost 40 miles above the mouth of the Big Horn River. This land was once part of the Crow Indian Reservation but opened to white settlement in 1906. Livestock ranching and irrigated crops are important. The Holly Sugar Refinery is the major industry. Fifteen miles south on the Little Big Horn River is Crow Agency, location of a Bureau of Indian Affairs Office for the Crow Indian Reservation. A few miles farther south is the historic site of the Battle of the Little Big Horn, now a National Monument and a National Cemetery. Upriver on the Big Horn about 40 miles southwest of Hardin is the nearly completed Yellowtail Dam, a major structure for power generation, irrigation, and recreation.

Billings, Montana, elevation 3,122, is a city of 52,851 population. The metropolitan area in 1960 had 78,000 population. Billings is the wholesale center for eastern Montana. Its industries include two meat-packing firms, auction and commission yards, a canning company, and one of the larger sugarbeet refineries of the world, two potato-chip factories, flour mills, feed mills, grain elevators, and allied processing plants. The city is served by three railroads, three airlines, four bus companies, and a large number of truck lines. The population of Billings increased 64 percent since 1950; most of this expansion came with the discovery of oil in the Williston Basin. Billings is a headquarters for several major oil companies. Two large, modern refineries in Billings, and a third at Laurel, 17 miles west, make up 80 percent of Montana's refining



RELATIVE POPULATION GROWTH OF FIVE CITIES.

Figure 9

capacity. Two crude-oil pipelines connect these refineries with oil fields in Montana and Wyoming, and two pipelines carry refined products, one east to Glendive, Montana, to end eventually at Minot, North Dakota, the other line flows west to Spokane, Washington. Two four-year colleges in Billings serve eastern Montana. The airport rated 105th out of 222 nationally in air traffic for the year 1959.

Laurel, Montana, elevation 3,297 feet, population 4,601, is a division point on the Northern Pacific Railroad. The population rose from below 1,000 in 1910 to a little over 2,000 in 1920 and climbed very slowly until 1940, in 1950 3,000 was exceeded. An oil refinery, the junction of the Great Northern, Chicago, Burlington and Quincy, and the Northern Pacific railroads, and the car repair shops of the Northern Pacific, plus local irrigated farming and livestock ranching support the town. The Clark's Fork River flows into the Yellowstone River here.

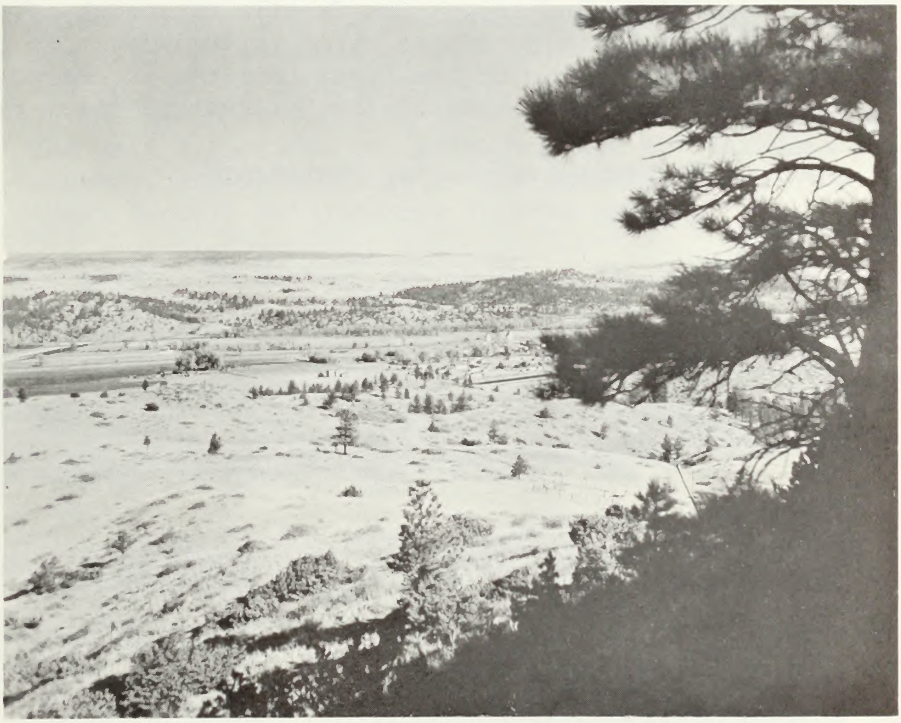


Figure 10: A typical small town along the Yellowstone River, Reed Point, Montana, relies on tourists, logging, farming and livestock ranching.

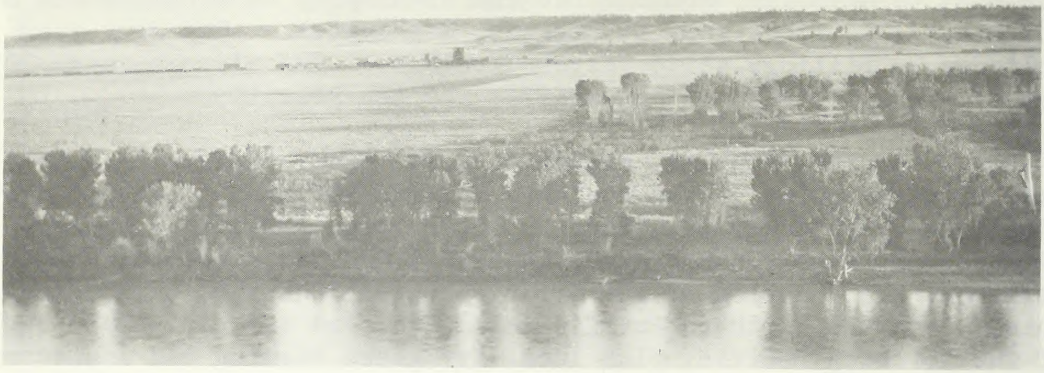


Figure 11: Custer, Montana, 1909. A pair with figure 12. This town on the Northern Pacific Railroad lies south of the river and across the fertile sagebrush-covered alluvial plains of the river bottomland. In the background are two of the river terraces so characteristic of the physiography of the Yellowstone River Valley.

U. S. Geological Survey Photograph

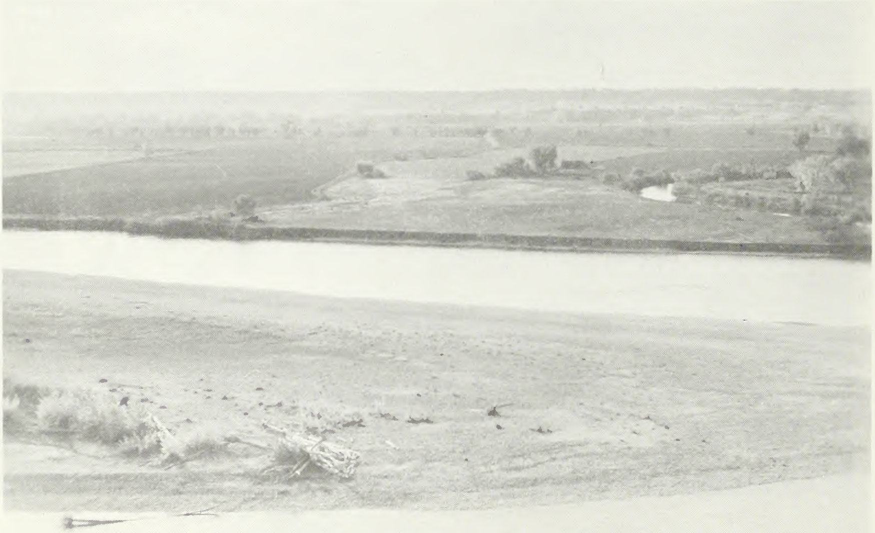


Figure 12: Custer, Montana, 1962. Fifty-three years later. The town is now hidden by its shade trees. The agricultural development of the basin is seen in the irrigated soils of the bottomland; the rangeland has disappeared. The rapidly changing river has formed a new island and cut away the south river banks and its cottonwoods.

To the south of Laurel is Red Lodge, Montana, a one-time terminus for the Northern Pacific. The city is built at the base of the mountains. After a decline of the coal industry Red Lodge developed as an agricultural and recreation center. Red Lodge's population trend was unlike that of other cities along the Upper Yellowstone. The population, less than 1,000 in 1890 was over 2,000 in 1900, and by 1910 it was almost 5,000. From 1910 the population dropped gradually until 1920, when it dropped very sharply to nearly 3,000. The population has declined gradually ever since; by 1960 the town again had a little over 2,000 people.

Livingston, Montana, a railroad city, has a population of 8,299 and an elevation of 4,500 feet. Here the Yellowstone River turns to the south and a mountain wall confronted the Northern Pacific when the rails came west; tunnels driven by miners from Butte broke through the barrier. Economic activity began in the eighties at nearby Emigrant Gulch, with the discovery of gold. In 1890 Livingston had a population of nearly 3,000 followed by a slight drop until 1900, since then the city has steadily grown. In 1910 the population was over 5,000 and in 1920 it reached 6,000. It was still in the 6,000 area in 1940, and moved to 7,000 in 1950 to attain its present size in 1960. The main industries of Livingston are the railroad and lumbering industry, and agriculture. The principal servicing facilities for the Northern Pacific Railroad are located here.

The population centers of the Upper Yellowstone Basin, all in Montana, are small, except for Billings. Figure 10. Their growth is dependent on developing agriculture, recreation, mining, and especially industry. Communities of note in addition to those previously named, are Custer, figures 11 and 12, Columbus, Huntley, Big Timber, and Gardiner. Montana lags behind most of the United States in growth rate but does lead her neighboring states.

Transportation and Communications

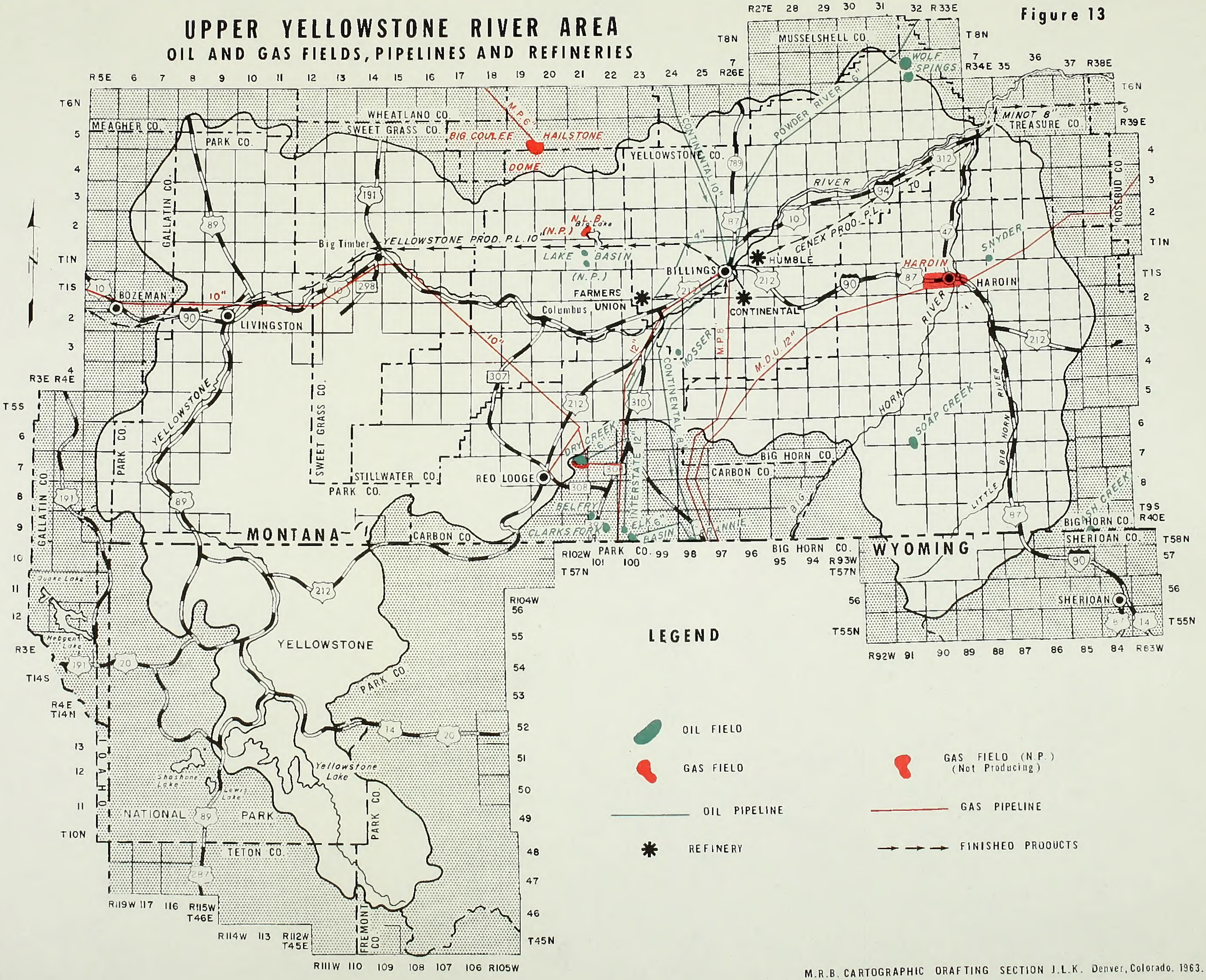
The rivers were the first major routes of travel. Today the east-west axis of the Yellowstone River Valley still determines the location of routes not only of travel but communication. Captain Raynolds, a U. S. Army Topographic Engineer, wrote in 1860,"...the broad valley of the Yellowstone affords peculiar facilities for a railroad, and it is, moreover, the most direct route to the important region about Three Forks..."

The river steamboat "Josephine" in 1874 moored at the head of navigation at Coulson (long since absorbed into Billings). River travel survived for but 10 years until in 1884 when it was displaced by the more expensive but more dependable railroad.

Figure 13

UPPER YELLOWSTONE RIVER AREA

OIL AND GAS FIELDS, PIPELINES AND REFINERIES



M.R.B. CARTOGRAPHIC DRAFTING SECTION J.L.K. Denver, Colorado. 1963.

The Northern Pacific, the first railroad in Montana, received land grants of 10 alternate sections per linear mile of track where the road passed through states,and twenty sections where it passed through territories. For crossing the plains and the mountains of the west, it was to receive more than 38 million acres, the largest single land grant to a "Pacific" railroad.

The Northern Pacific came west through the level plains to follow the easy grades of the Upper Yellowstone first to Billings, in 1882, then on to Livingston in 1883. In 1883 a spur, south from Livingston to Gardiner,opened "The Gateway to Yellowstone Park".

Other railroads of the sub-basin also benefited by the land grants. The Chicago, Burlington and Quincy Railroad crossed north over central Wyoming and southeast Montana, skirted the Big Horn Mountains, then paralleled the valley of the Yellowstone River to Laurel. The Great Northern Railway joined the Northern Pacific and the Chicago, Burlington and Quincy Railroads at Billings to serve the northern and western parts of the State.

Topography forces a pattern on the highways similar to that of the rail lines. The east-west axis of the Upper Yellowstone Valley, followed by U. S. Highway 10 and 12, is the most important route through Montana, with a 1200-1800 traffic density. 1/ Totaled together Montana's three other east-west highway routes combine for but 2300 traffic density.

Frontier, Northwest, and Western Airlines are scheduled into Billings, with both transcontinental and international air routes. The airport is relatively busy, ranking roughly midway among the major airports of the nation.

Major bus companies, Continental Trailways and Greyhound maintain a full service in the Upper Yellowstone River Area.

Oil and gas pipelines are a fundamental need of the petroleum industry. Pipelines carry both crude oil and gas into the processing area of Billings for redistribution or refining and reshipment both west and east. Figure 13.

1/ Traffic density is taken from Montana State Highway Department figures using annual averages of commercial and non-commercial vehicles for a 24-hour day. The figures given are for through traffic on an entire route and are the lowest number of vehicles on any part of that route.

Utilities

Electrical

Electricity is supplied to the sub-basin by a network of the public lines of the Bureau of Reclamation and the private lines of the Montana Power Company.

Electric power is produced within the basin by Montana Power with a hydroelectric plant at Mystic Lake generating 11,500 KW power and a thermalelectric plant at Billings generating 66,000 KW. A major addition to the basin's power will be from the Bureau of Reclamation 250,000 KW power plant under construction at Yellowtail dam site.

Potential hydroelectric dam sites are relatively few (Appendix A, large scale basin maps and figure 14). Future electric power generation in the basin may come from steam. Only 15 years ago the Pacific Gas and Electric Company produced 63 percent of its electric power from water, today 65 percent of its power is produced from steam plants using locally-mined coal. Just outside the basin, at Colstrip, Montana, and purchased recently by Montana Power, lies a reserve of coal estimated at 62 million tons, which will be used for future thermalelectric development. This is encouraging, for vast coal reserves lie within the basin.

Gas

Natural gas is supplied for industries and homes by pipelines of Montana Power Company. The Dry Creek Field line, the Montana-Dakota utility line and the Hart Mountains Gas Field line supply the basins needs.

Water

Water is a vital resource of the Upper Yellowstone Area, for irrigation, for recreation, and for municipal and industrial uses. Its economic value varies with its use. The University of New Mexico estimates (for New Mexico) the average value to an economy through irrigation is from $44 to $51 an acre-foot; recreational use of water by fishing and boating increases this to approximately $250 per acre-foot and an acre-foot of water for industrial purposes attains a value of from $3,000 to $4,000.

Industries use great quantities of the waters of the Yellowstone River. For example, the oil refinery at Laurel, circulates cooling water directly from the Yellowstone River at a rate of 20 to 25 thousand gallons per minute; in Billings the Humble Oil Company's refinery recirculates 30 thousand gallons of water per minute (roughly 43 million gallons daily). In Billings commercial and industrial water use amounts to $850,000 yearly.

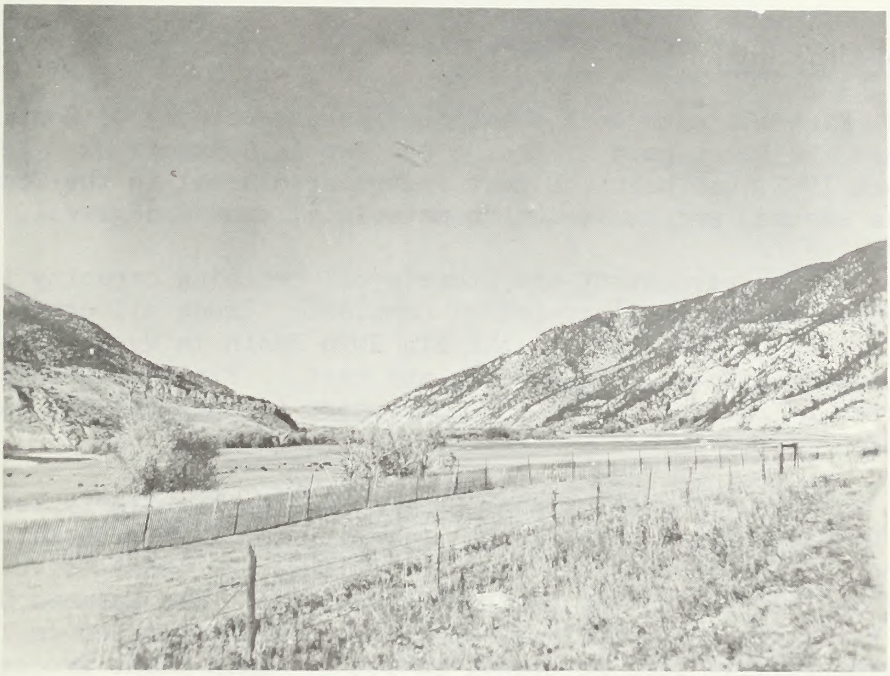


Figure 14: Allenspur Gap. Potential power sites are rare along the Yellowstone River. This gap bounded on either side by isolated tracts of public domain has been withdrawn as a power site.

Domestic Water Consumption

The metropolitan population of Billings in 1960 was approximately 78,000. A total of 4¼ billion gallons of water were sold by the City of Billings. Peak consumption is in the hot months, June, July and August, use in each of these months totaled 25 million gallons, in September it dropped to 10 million. Most of this water is used for sanitary purposes and returns to the river through sewers which intercept subsurface water. This intercept, at Billings, gives a fifteen percent higher sewage return (10-12,000,000 gallons per day) into the Yellowstone River than was taken out for city use. This bonus return to the river is roughly ten to twelve million gallons in one day ! By comparison irrigated lands return roughly but 40 percent of the intake.

The increase in population experienced by Billings, with a jump of 64 percent in 10 years, caused no water supply problems. Competition for water, already critical in some localities, between the needs of cities, industries, agriculture, and recreation has not, as yet, developed in the Upper Yellowstone Basin.

Mining and Minerals

Minerals have been a mainstay in the economy of Montana ever since the first gold strike. See Map in Appendix G. Petroleum, since 1957, has been the most important mineral in the State; copper is second, and construction materials, sand and gravel, third.

Eighty percent of the State's oil refining capacity is concentrated in the Billings-Laurel complex. Crude oil comes from the oil fields to the south in the Big Horn Basin in Wyoming and from the Montana oil fields to the north and east. Finished products are transported by rail or pipeline to consumers to the west and east. Figure 13.

Humble Oil and Refining Company's "Enco" refinery built in 1947 at Billings has a total annual capacity of 12 million barrels. The Conoco refinery, built in 1949 at Billings, processes five and one-half million barrels of crude oil annually. The Farmers Union Central Exchange, Inc., refinery at Laurel was established in 1929, closed temporarily, then re-opened in 1933. This plant processes seven million barrels of crude oil per year. Together, these three refineries process the bulk of the oil of the State. In 1960, out of 25 million barrels of crude oil entering Montana, the refineries of the Upper Yellowstone Basin handled 20.7 million barrels. Of the 20.7 million barrels of crude refined in 1960, 13.4 million barrels (70 percent) came from Wyoming. The remaining crude oil is Montana produced.

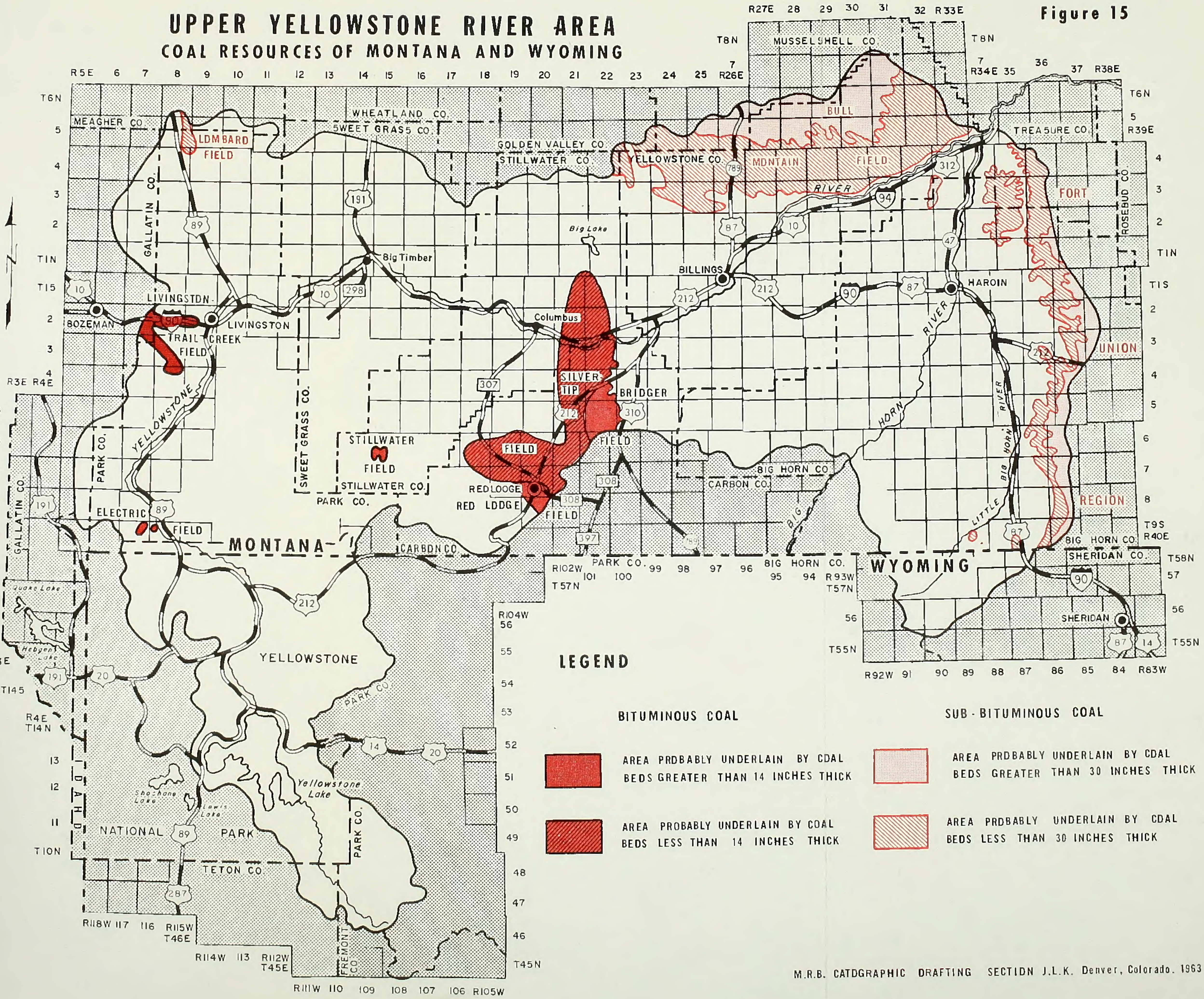
Product pipelines from the refineries go to Minot, North Dakota (8-inch line), and Spokane, Washington (573 miles, 10-inch line).

Technical Developments

Coking coal is necessary in smelting iron and lead ores. Most of the coking coal used in Montana originates in the mid-western United States, (a small amount is found in Park County). Previously, bituminous and sub-bituminous coals have not made good coking coal. Pilot plants at Kemmerer, Wyoming, and Red Lodge, Montana, may make such conversion possible. Such a development will stimulate the depressed coal industry. The coal resources of the basin are almost unbounded. Figure 15.

Figure 15

UPPER YELLOWSTONE RIVER AREA
COAL RESOURCES OF MONTANA AND WYOMING



M.R.B. CARTOGRAPHIC DRAFTING SECTION J.L.K. Denver, Colorado. 1963.

Montana's petrochemical future most probably will come in the Billings-Laurel complex of petroleum refineries. The immediate petrochemical potential for Montana appears to be in nitrogenous fertilizers rather than fuels. But fuels have a definite future because of the large quantities of water, coal, and oil available here. Synthetic fuels require large quantities of water The Bureau of Mines estimates 8,100 tons of coal and 7,3000,000 gallons of water are needed to make 10,000 barrels of synthetic fuel per day. A gas synthesis plant with a similar capacity would require 11,150,000 gallons of water per day.

Mineral Wealth By Counties

Carbon County led the Upper Yellowstone Basin in 1960 with sales of $7,968,000 (a decrease of $3.5 million from 1959) in petroleum, coal, uranium, sand and gravel sales. Bituminous coal, a major mineral in the historic economy of the area, continued its decline in 1960.

Uranium occurs in some low-grade coal ores of Carbon County. Shipments from six mines totaled 1,726 tons valued at $29,000.

Yellowstone County had a total production for 1960 of $1,685,000 in petroleum, sand, gravel and clay. Montana Lightweight Aggregate in Yellowstone County produces an expanded shale for use as a lightweight aggregate. This county is also a producer of high-purity elemental sulfur with one company operating. The hydrogen sulfite used in this process comes from the two oil refineries at Billings. Limestone is calcined for beet-sugar processing at the Great West Sugar Refinery at Billings.

In Stillwater County chromium led in importance, followed by stone, petroleum, gold and silver. The chromite deposits near Nye are low-grade but chromium in wartime is always in short supply and an essential metal. In 1960 the American Chromite Company produced chromite for government stockpiling -- a preparation for future national emergency. Production then total 106,716 tons of concentrate, leaving 82,000 tons for future delivery. The plant closed in 1961 following completion of the contract.

Sweetgrass County mineral production was mostly of sand and gravel.

In Park County, building stone, limestone, granite and sandstone sales, roughly $1,600,000 in 1960, have replaced the once important gold ore.

The State of Montana, in 1962, received about $5,600,000 from the Federal government as its 37½ percent share of monies collected from oil and gas leases on public lands. The following amounts were received by upper sub-basin counties:

Carbon County	$1,609,876.50
Stillwater County	14,464.84
Sweetgrass County	6,866.75
Park County	1,332.75
Yellowstone County	3,572.76
Total	$1,636,113.60

AGRICULTURE

General Review

Agriculture in the Upper Yellowstone River Area varies from extensive livestock production on native range to intensive irrigated farming with sugar beets, beans, and vegetables for canning and market, or berries and horticultural specialties. Beef cattle, sheep, and dairy cattle are each important. Both irrigated and dryland farms are typical.

Agricultural data for the Upper Yellowstone Area were compiled for the five principal counties of the area: Carbon, Park, Stillwater, Sweetgrass and Yellowstone. Big Horn County was excluded because it is mainly Crow Indian Reservation and virtually devoid of public domain. The statistics of the five counties listed, however, give a representative picture of the agriculture of the Upper Yellowstone River Area.

Grazing land makes up 50 percent, and cropland 14 percent of the basin. Cropland varies from a low of 7 percent of the county in Sweetgrass, to a high of 20 percent in Yellowstone County. Grazing land varies from a low of 42 percent in Park County to a high of 77 percent in Yellowstone County. Park County is 50 percent covered with mountains. Yellowstone County has only 3 percent of its area mountainous. Of a total of seven million acres in the five principal counties, roughly four million acres are in grazing land, nearly one million acres in cropland and a little over two million acres are mountains or wasteland.

All but the rugged mountains of the Upper Yellowstone Area are used for grazing and farming. Most land suitable by site and soil is farmed; most arable land with available gravity water is irrigated. According to the 1959 farm census, non-irrigated farmland exceeds irrigated land by the ratio of 2:1 (662,000 acres of non-irrigated crop land to about 301,000 acres of irrigated cropland) in the five counties. An inventory of irrigable land in this area by the Montana State Engineer, showed an additional 118,000 acres of potentially irrigable land. Crops were harvested from 530,000 acres in 1961, of which 211,000 acres were irrigated and 318,000 acres were non-irrigated.

Characteristics of Farms and Ranches

In 1959 more than half of the farms and ranches in the area were livestock enterprises. In a total of 3,407 farms and ranches in the area livestock farms and ranches number 1,728 or 52 percent; most were beef cattle enterprises. Livestock farms other than poultry or dairy comprised 1,590 or 47 percent of the total. Livestock ranches alone, nearly all beef cattle, numbered 558. Dairy farms numbered 138 or 4 percent. Poultry farms were few, numbering only 21 or six-tenths of 1 percent.

Field crops farms are the second largest number, 704 or 21 percent. Cash grain farms number 478 or 14 percent, and other field crops accounted for 226 farms or 7 percent of the total. Third in number were miscellaneous and unclassified farms, 699 or 20 percent of the total number. Least numerous were the general farms. Only 276 farms, or 8 percent of the total, were sufficiently diversified to be considered a general farm in the 1959 census.

Commercial farms numbered 2,755 or 81 percent, "other" farms were 652, or 19 percent. Part-time farms were 417, or 12 percent, and 234, or 7 percent, were part-retirement farms.

Land use on farms and ranches varied but little from 1954 to 1959. In 1954 roughly 3,400 farms harvested about 545,000 acres of cropland. Five years later about 3,000 farms harvested nearly 541,700 acres of cropland. More cropland was used for pasture in 1959 -- 135,000 acres -- as compared with 86,000 acres in 1954. Cropland not harvested and not pastured increased from 261,000 acres in 1954 to slightly over 285,000 acres in 1959. Summer fallow land increased from 240,000 acres in 1954 to 251,000 acres in 1959. Grazing use increased from 3,900,000 acres in 1954 to 4 million acres in 1959. Irrigated lands in farms decreased slightly from about 306,000 acres in 1954 to roughly 300,000 acres in 1959.

In dryland farming, the most common practice is that of summer fallow; one-half of the land is placed in a cultivated crop, the remaining one-half is in summer fallow and kept free of weeds so that it can store the moisture. The following year the fallow and cultivated areas are reversed. A variation of the summer fallow for wind erosion control is strip cropping, wherein fallow and small grain crops are in alternate bands.

In 1959 crops were harvested from 361,000 acres; of this, 251,000 acres followed the summer fallow plan. Of 288,000 acres of grain harvested in 1959, 222,000 acres were produced from strip crop cultivation.

Crop Production and Value

Hay is the leading crop. Its value was 9.1 million dollars for 357,000 tons from 212,000 acres; most of it is alfalfa from irrigated land. Wheat is the second crop. Its value was 5.7 million dollars for 3.2 million bushels from 184,000 acres; only 15,000 acres of wheat were irrigated, which produced 504,000 bushels. Sugar beets are the third most valuable crop. 3.8 million dollars worth was produced on 18,000 irrigated acres with a yield of 271,000 tons. Barley is the fourth crop. Its 1.6 million dollar crop was produced on 85,000 acres with a yield of 1.7 million bushels. Only 15,900 acres of barley were irrigated. This was 19 percent of the harvested acreage, but gave 45 percent of the yield.

Dry beans are fifth in value with 1.1 million dollars received for 187,000 one-hundred pound sacks from 9,700 irrigated acres. Sixth crop in value is oats, with $584,000 worth produced on 16,500 acres, with a yield of 851,000 bushels. Oats are the only small grain raised chiefly on irrigated land; 14,000 of the 16,500 acres were irrigated.

Potatoes, seventh crop in production value, is the only other crop valued in excess of $50,000. The 1961 total was $90,000 from 286 harvested acres, with 47,500 one-hundred pound sacks. All but 20 acres were irrigated. Other crops in order of value in 1961 were: Garden and truck $50,000; alfalfa seed $49,000; corn $44,000; rye $6,700; flax seed $5,400; and crested wheatgrass seed $2,800.

Irrigated crops produced an average of $69.85 per harvested acre. Highest crop value per harvested acre was that of potatoes, $314.34 on irrigated land. Sugar beets produced an average of $210.64 per irrigated harvested acre for second place. In third place were dry beans with $116.51 per irrigated acre. Gardens and truck were fourth with $100 per irrigated acre. (Figure 16).

Non-irrigated crops produced an average of $23.81 per harvested acre. Rye has the dubious distinction of producing the lowest return per acre -- $9.57 on non-irrigated land.

The most important crop both in total value and area harvested is hay. Irrigated hay land produced an average of 2.17 tons per harvested acre, and .81 ton on non-irrigated land. Total hay land harvested in 1961 was 212,000 acres, with 137,000 acres irrigated and 75,000 acres non-irrigated. The irrigated hay land produced over 296,000 tons or 83 percent of the total from 65 percent of the area.

Wheat is the principal dry-farmed crop. The average yield for the 43-year period 1919 to 1961 was 17.47 bushel per harvested acre.

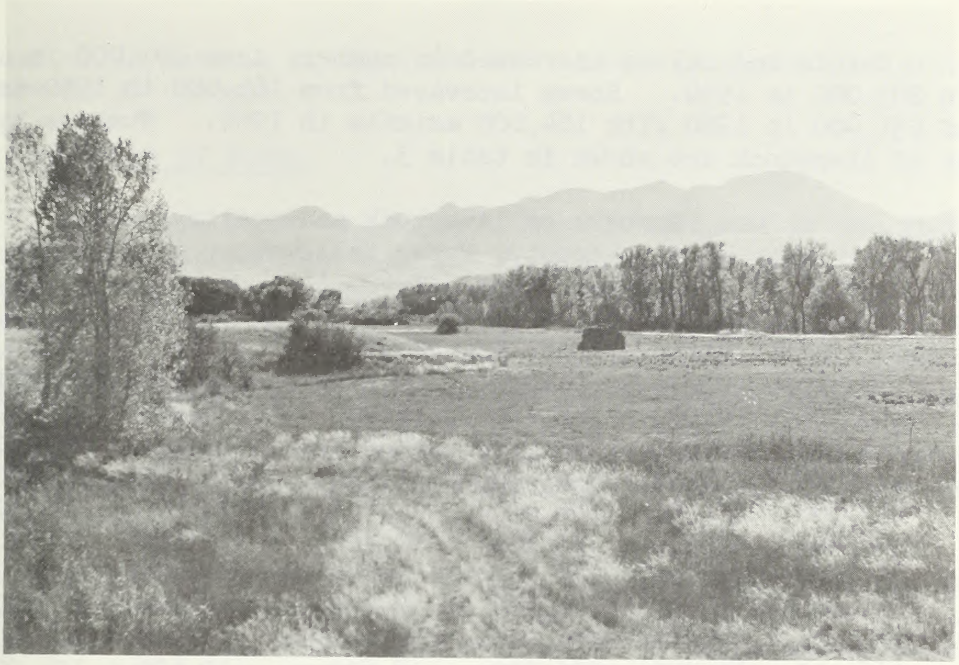


Figure 16: Typical irrigated hay land. Return per acre is low but hay is the most important crop in both acreage and total value in the Upper Yellowstone valley.

Extremes were 27.33 bushels average per harvested acre in 1958 and 6.60 bushels per harvested acre in 1930. Since 1938 wheat yields have been good, ranging from a low of 14.54 bushels per harvested acre to the 27.33 bushel yield of 1958.

Average cropland planted to wheat over the 43 years from 1919 to 1961 was 268,000 acres. The average cropland harvested was 244,000 acres. Plantings have decreased since 1953 to 203,000 acres in 1961.

Reduction in the acres planted to wheat has increased the planting of other grains, principally barley. Barley acreage increased from 12,300 acres in 1938 to 102,600 acres in 1961. The increase has been mostly on dry-farmed land.

Livestock

Beef cattle and sheep production are important, both on the ranges and farms. Cattle and sheep feeding is an important business. The Great Western Sugar factory at Billings sells fresh and dried beet pulp for livestock.

Cattle and calves increased in numbers from 194,000 in 1950 to 283,000 in 1956. Sheep increased from 165,000 in 1950 to a peak of 231,000 in 1960 with 184,000 animals in 1962. Numbers by classes of livestock are shown in table 3.

Table 3. Numbers of livestock and poultry in the five county, Upper Yellowstone Area, Montana, 1950 - 1962. 1/

Year	All Cattle & Calves	Milk Cows	Sheep & Lambs	Horses & Mules	All Hogs	All Chickens
1950	194,100	20,000	165,100	16,600	24,200	280,300
1951	211,300	19,600	180,000	14,800	21,800	254,800
1952	231,600	19,200	192,600	13,100	34,300	258,000
1953	261,100	17,900	186,500	11,700	21,800	243,600
1954	269,100	18,300	183,200	10,700	10,600	226,500
1955	259,300	18,000	182,000	9,600	15,700	223,600
1956	282,800	16,800	193,000	8,900	18,600	213,800
1957	276,000	15,800	200,600	8,700	15,500	217,200
1958	266,100	15,300	206,900	8,800	13,400	194,900
1959	281,000	14,200	223,800	8,800	17,300	189,600
1960	255,500	14,400	231,200	9,200	21,000	192,100
1961	234,600	13,500	205,800	9,400	21,200	188,900
1962	238,400	13,400	184,800	9,400	20,700	184,000
Average	250,838	16,646	195,085	10,476	19,700	220,562

1/ Compiled from Montana Agricultural Statistics, Montana Department of Agriculture, Labor and Industry, Helena, Montana; Volumes III-IX, 1950 - 1962.

Dairy cattle are decreasing, but milk production has been maintained. Hogs numbers remained fairly stable during the period 1950-1962. Chickens have decreased to less than two-thirds of their 1950 number of 280,300.

Billings is a large and active livestock market. Total average annual out-shipments were 236,000 for the period. Net out-movement of cattle in the five county area has varied from 380,000 head in 1958 to 104,000 head in 1960. Calves lead in numbers, with 72,000 head shipped annually. Steers are second with an annual average of 69,000 head. Cow and heifer shipments average 45,000 and 42,000 annually.

Sale Value of Agricultural Products

In 1961, farm cash receipts of the five county area amounted to 37.8 million dollars, an average of $10,400 from each of the 3,641 farms in the area. Livestock and their products produced 23.8 million dollars or 63 percent of total sales. Crops produced 14.1 million dollars or 37 percent.

Size and Value of Farms

In 1959 there were 3,336 farms and ranches in the five Upper Yellowstone Area counties, a decrease of 520 from 1954. Largest decrease was in the numbers of small farms. Farms under ten acres fell from 276 to 99, a decline of 64 percent. Those of 70 to 99 acres were reduced from 203 to 148, a reduction of 27 percent. Farms of all sizes decreased in number except those of 1,000 acres and over. These increased from 1,076 to 1,099, or two percent. This trend is general throughout the United States with increase in size of economic farm and ranch units made possible by increased mechanization.

Land in farms and ranches in the five Upper Yellowstone counties increased five percent from 4.7 million acres in 1954 to 5.1 million acres in 1959. The average farm or ranch increased in value from $38,000 in 1954 to about $64,000 in 1959, an advance of approximately 62 percent. Part of this increase was due to an increase in size but on a per acre basis the value went from $29.50 to $41.20, an increase of 40 percent.

FORESTRY

Forest lands occupy over two and one-half million acres of the Upper Yellowstone Basin. Figure 17. Of this total, noncommercial or reserved forests make up approximately one and three-quarter million acres. Most of the reserved forests are noncommercial and preserved as primitive areas an important recreational resource.

Commercial timber stands of approximately 840,000 acres, are dominated by three tree species, Douglasfir, ponderosa pine, and lodgepole pine. Cottonwood and aspen, of secondary importance, are a source of fuel and posts of low quality. Commercial timber, except for the ponderosa pine type, is concentrated in the western portion of the basin. Figure 17.

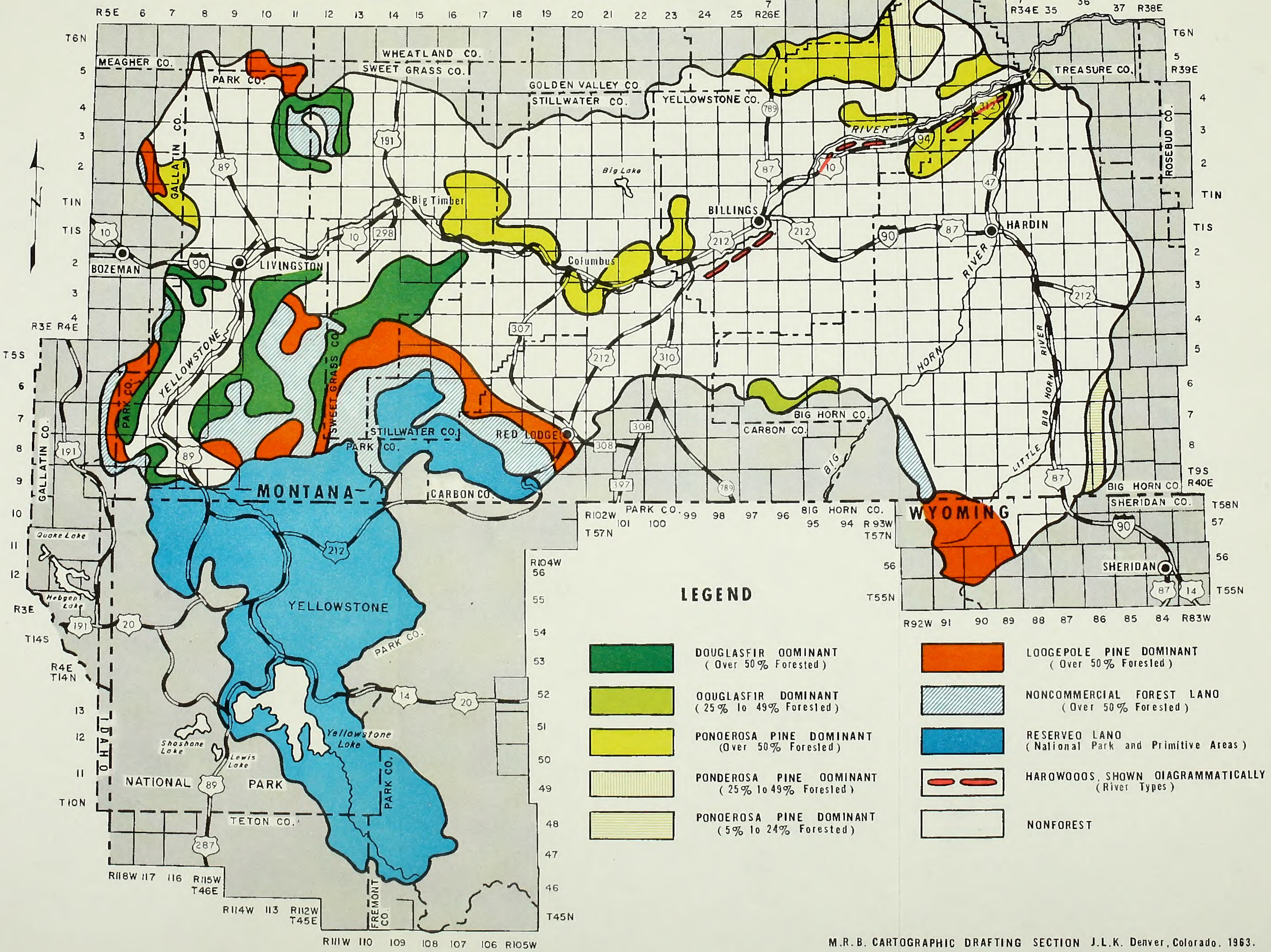
Management

Parts of three national forests are included in the sub-basin. Of the three the most timber has been cut in the Gallatin and Custer National Forests in Montana, followed by the Big Horn National Forest in Wyoming. The Gallatin and Custer Forests harvested a total of 51.9 million board feet from 1950 to 1960. The Big Horn harvest was primarily corral poles. In Montana, the harvest from the National Forests for 1961 - 1970 is anticipated to be 164.1 million board feet -- a three-fold increase and in Wyoming the Big

Figure 17

MAJOR FOREST TYPES
UPPER YELLOWSTONE RIVER AREA

Based on Forest Resources of Montana, U.S.D.A. Forest Service Report No. 5


LEGEND
🟩 DOUGLASFIR DOMINANT (Over 50% Forested)
🟩 DOUGLASFIR DOMINANT (25% to 49% Forested)
🟨 PONDEROSA PINE DOMINANT (Over 50% Forested)
▨ PONDEROSA PINE DOMINANT (25% to 49% Forested)
▨ PONDEROSA PINE DOMINANT (5% to 24% Forested)
🟥 LODGEPOLE PINE DOMINANT (Over 50% Forested)
▨ NONCOMMERCIAL FOREST LAND (Over 50% Forested)
🟦 RESERVED LAND (National Park and Primitive Areas)
HARDWOODS, SHOWN DIAGRAMMATICALLY (River Types)
☐ NONFOREST
MUSSELSHELL CO.
WHEATLAND CO.
SWEET GRASS CO.
MEAGHER CO.
PARK CO.
GALLATIN CO.
GOLDEN VALLEY CO.
STILLWATER CO.
YELLOWSTONE CO.
TREASURE CO.
ROSEBUD CO.
BIG HORN CO.
CARBON CO.
SHERIDAN CO.
TETON CO.
FREMONT CO.
Big Lake
Big Timber
BILLINGS
HARDIN
BOZEMAN
LIVINGSTON
Columbus
RED LODGE
SHERIDAN
MONTANA
WYOMING
IDAHO
YELLOWSTONE NATIONAL PARK
Yellowstone Lake
Shoshone Lake
Lewis Lake
Quake Lake
Hebgen Lake
YELLOWSTONE RIVER
BIG HORN RIVER
LITTLE BIG HORN RIVER
BIG HORN
RIVER
10
89
90
191
298
87
212
94
312
47
789
307
310
308
397
20
14
287
R5E 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 R26E
R27E 28 29 30 31 32 R33E
R34E 35 36 37 R38E R39E
T6N 5 4 3 2 T1N T1S 2 3 4 5 6 7 8 9 10 11 12
T8N 7
T9S R40E
R3E R4E T5S T14S T14N
R102W 101 100 99 98 97 96 95 94 R93W T57N
R104W 56 55 54 53 52 51 50 49 48 47 46 T45N
R92W 91 90 89 88 87 86 85 84 R83W
T58N 57 56 T55N
R118W 117 116 R115W T46E
R114W 113 R112W T45E
R111W 110 109 108 107 106 R105W
13 12 11 T10N

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Horn Forest forecasts its harvest for the same period as 68 million board feet; a total timber harvest for the basin of over 232 million board feet -- four times that of 1950 - 1960.

The State-owned forests (Montana and Wyoming) expect no substantial timber harvest in the Upper Yellowstone Area for 1961 - 1970. Neither State produced commercial timber in the decade 1950 - 1960.

Management is being intensified on the forests of the public domain, both on those valued solely for timber and those on which timber production is but one of several uses. The Missouri River Basin Studies in 1960 and 1961 in this sub-basin recognized roughly 3,000 acres as suited solely for timber production. Other timbered areas wherein timber was scattered were incorporated into range sites or regarded as suitable for recreation use, watershed, grazing, etc., as multiple use areas.

The Billings District Office found that over 31,000 acres have trees of some description. Most of this acreage, over 19,000 acres, is noncommercial timber. Of the remaining acreage roughly 11,500 acres have Douglasfir or ponderosa pine timber with sufficient growth to be classed as either saw logs or pole size. Of this acreage about 2,100 acres are saw timber, the remainder is pole size. About 400,000 board feet can be harvested annually under good management. Seedlings and saplings occur on a little under 300 acres. Minor acreage of commercial aspen and cottonwood total roughly 75 acres.

The decade of 1961 - 1970 will have more substantially larger timber sales than occurred in the previous ten years. Increased emphasis on harvest by the two Federal agencies, the Forest Service and the Bureau of Land Management, means additional income for the basin. The anticipated ten-year harvest represents a value of approximately $23 million dollars.

Sawmills and logging operations are grouped to the west, close to the greatest source of timber. Livingston, Montana, has several sawmills. Figure 18. Single mills are found in nearby towns and portable mills higher in the mountains are shifted from site to site. Timber for the portable mills usually comes from private sales, often from lands owned by the Northern Pacific Railway. Private farms and ranch sales of lumber for the basin in 1959 were $128,000, an increase over 1954 of $61,000.

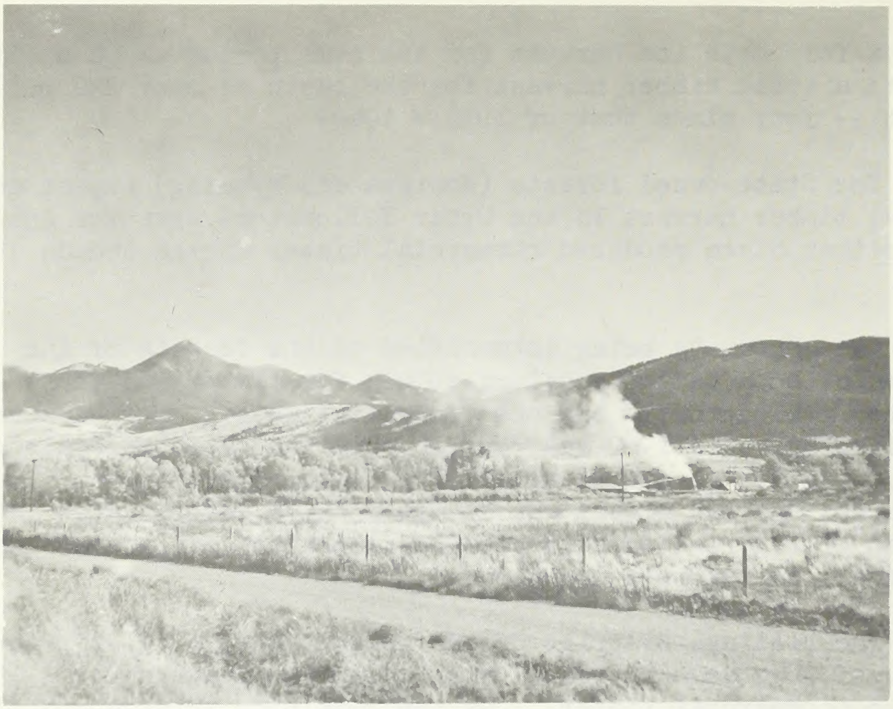


Figure 18: A lumber mill near Livingston, Montana, is one of five operating in the heavily timbered western end of the basin.

RECREATION

The first dude ranch of Montana's history was established in 1911 in the Upper Yellowstone Basin, at the base of the Crazy Mountains (figure 19). Recreation is big business now.

Statewide, total expenditures by visitors in 1957 were 89 million dollars and by 1960 this amount had risen to 96 million dollars. To this must be added the expenditures of hunters and fishermen, whose licenses totaled 19 million dollars in 1960; and whose total spending reached 60 million dollars. Eliminating the overlap of visitors who also purchase hunting and fishing licenses, recreation is roughly a 150 million dollar a year business for Montana. By comparison, in 1960, Montana's livestock receipts were 202 million dollars, copper production was 59.6 million dollars, petroleum production was 77 million dollars and total cash receipts for agricultural crops was 175 million dollars.

A National Commission studying Montana's outdoor recreational facilities reported roughly 19,500,000 acres, or nearly 30,500 square miles, are devoted to some type of public recreation.

In 1960 a study by the State of Montana, striving for understanding of tourist motivation, found: "...the real motivating factor then, must be found in variety, new experience, curiosity, novelty, adventure, etc., rather than in scenic splendor and the great out-doors alone; many of them have this right where they are..." [1]

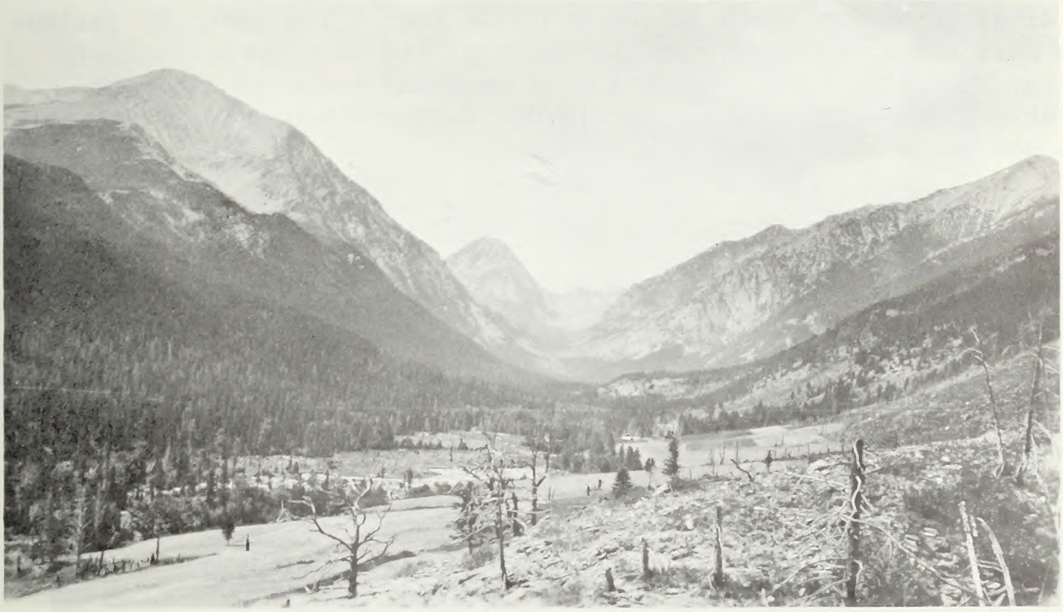


Figure 19: The Crazy Mountains. Montana's first dude ranch in 1911 was at their base.

U. S. Geological Survey Photograph. Circa 1910

Of the visitors to the State in 1960, 92 percent were interested in the scenery; 75 percent were interested in taking pictures; 66 percent visited historic sites, and over 50 percent were interested in nature. Camping and fishing, by comparison, rate far down the list of activities. The greater number of tourists are not active, they are observers rather than participants.

The single most important attraction is Yellowstone National Park, with two of its five entrances in the Upper Yellowstone Basin. In 1955, 28 percent of all tourists entering Montana were heading there. The main attractions are its unique hot springs, geysers and abundant wildlife.

---

[1] Tourist Travel and Expenditures in Montana, A Study of Highway Benefits, Montana State Highway Commission, 1958.

The country surrounding the Park is also attractive. Some is in Primitive Areas, preserves from which all motor transportation is excluded. The Beartooth Wilderness Area of the Custer National Forest has within its boundaries over 250,000 acres of ice-sculptured mountains and glacial lakes (figure 20). The Beartooth and Absaroka Wild Areas of 64,000 acres in the Gallatin Forest lie north of Yellowstone Park and join the Park along parts of its boundaries. In Wyoming, the Teton Primitive Area lies east and south of the Park boundary. Peaks tower well over 12,000 feet and hundreds of alpine lakes dot these reserves.

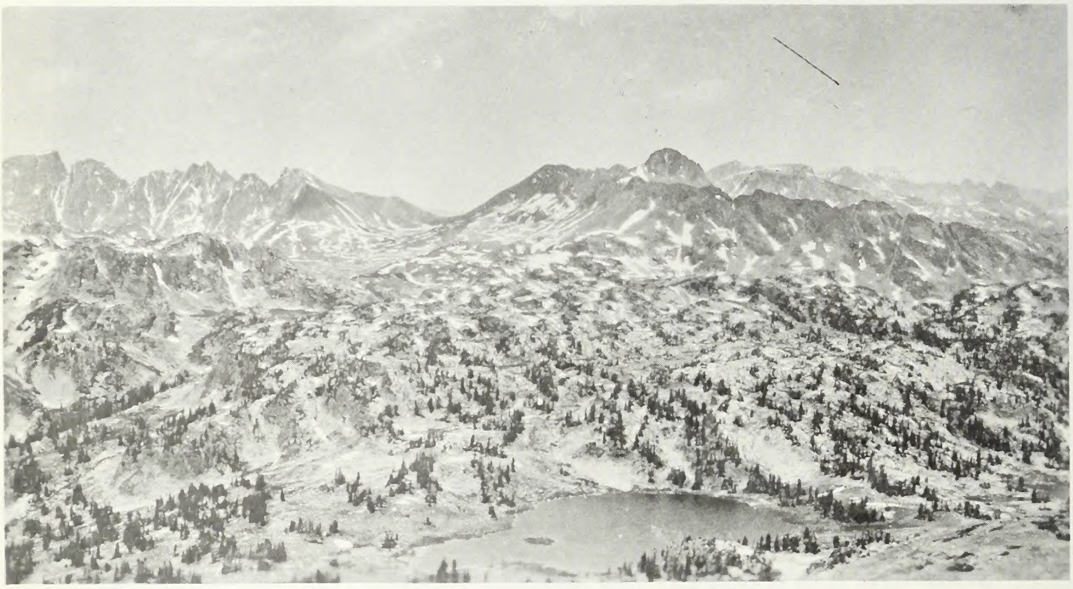


Figure 20: Beartooth Primitive Area, an important recreational site of the Upper Yellowstone Sub-basin, is accessible from the route to Yellowstone National Park on U. S. Highway 312.

U. S. Geological Survey photograph.

A primary attraction for many visitors is direct contact with the "Old West". For example, there is the Custer Battlefield National Monument, south of Crow Agency, Montana. An excellent museum has dioramas explaining the battle. Forty miles to the northwest is Pompey's Pillar the basin's first historic landmark on which William Clark carved his name in 1806. It is close to highways 10 and 12, a few miles east of Billings. Figure 8. Indian pictographs, in caves near Billings, figure 21, are also of interest, as are the historic old mines on the upper reaches of the River Basin above Livingston.

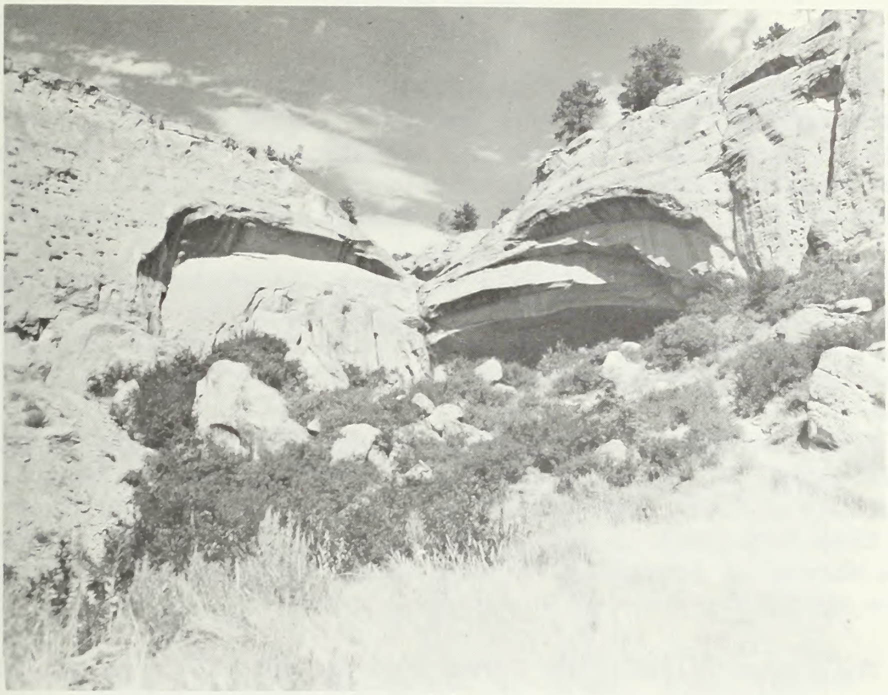


Figure 21: Inscription Caves in the high sandstone bluffs near Billings, Montana. Indians occupied this cave in pre-Columbian and historic periods. The walls and ceilings are blackened with years of fires and on the walls are well-preserved pictographs of hunting scenes. Vandals have damaged the caves.

The Badlands -- the "mauvais terres" of the early French trappers -- hold great interest for many hikers and picnickers. For "rockhounds" there is the lure of abundant semi-precious stones, particularly the agates of the basin.

Of the 21 ski centers in Montana two are located on the mountains south of the town of Red Lodge.

To aid vacationers, 43 camping and picnicking grounds are located along the basin's highways, with nine in Yellowstone Park. Some are limited to picnicking, and others have trailer space with full accomodations. (See Appendix B).

Hunting and Fishing

A major part of the recreational dollar, 60.3 millions per year, comes from the fisherman and the hunter. Fishing is the foremost of all active sports and lures over one-fourth of the sub-basin visitors.

The Yellowstone River is of particular importance -big river fishing is becoming scarce. From Gardiner to Big Timber around 100 river miles is rated Class 1 fishing (streams of national importance). This short stretch makes up one-fourth of all Class 1 fishing in the State, (with a total of 9,000 miles of fishing streams). Figure 22.

The mountain whitefish is probably the most important single species in the Yellowstone's upper reaches. Next in order of abundance are brown, rainbow,and cut-throat trout. Below Pompey's Pillar walleye and catfish are important warm water game fish.

From its source, and for 400 miles, trout fishing is good as far east as Laurel. The next 63 miles, however, between Laurel and Pompey's Pillar has the lowest fishing value of the entire river in its transition from cool to warm water species. Eastward of Pompey's Pillar the stream is dominated by warm water species, and fishing values rise to fair.

The Upper Yellowstone River Area is nationally known for its big game. Its most widely distributed big-game animals are mule-deer and antelope. Elk are in large numbers but restricted to their range. Antelope can be hunted throughout the plains. The southern and western third of the sub-basin in Montana, close to the Wyoming line, and up to Yellowstone Park, is open for hunting of bighorn sheep and mountain goats. Moose are taken from the Crazy Mountains and the Beartooth Range close to Red Lodge. Deer and bear are hunted throughout the sub-basin. (Figure 23).

Upland game, sharp-tailed grouse, sage-grouse, Hungarian partridges and Chinese pheasant are also hunted. Their habitat is marginal except for the Chinese pheasant.

Within the sub-basin the State of Montana has 47 game management and bird management areas.

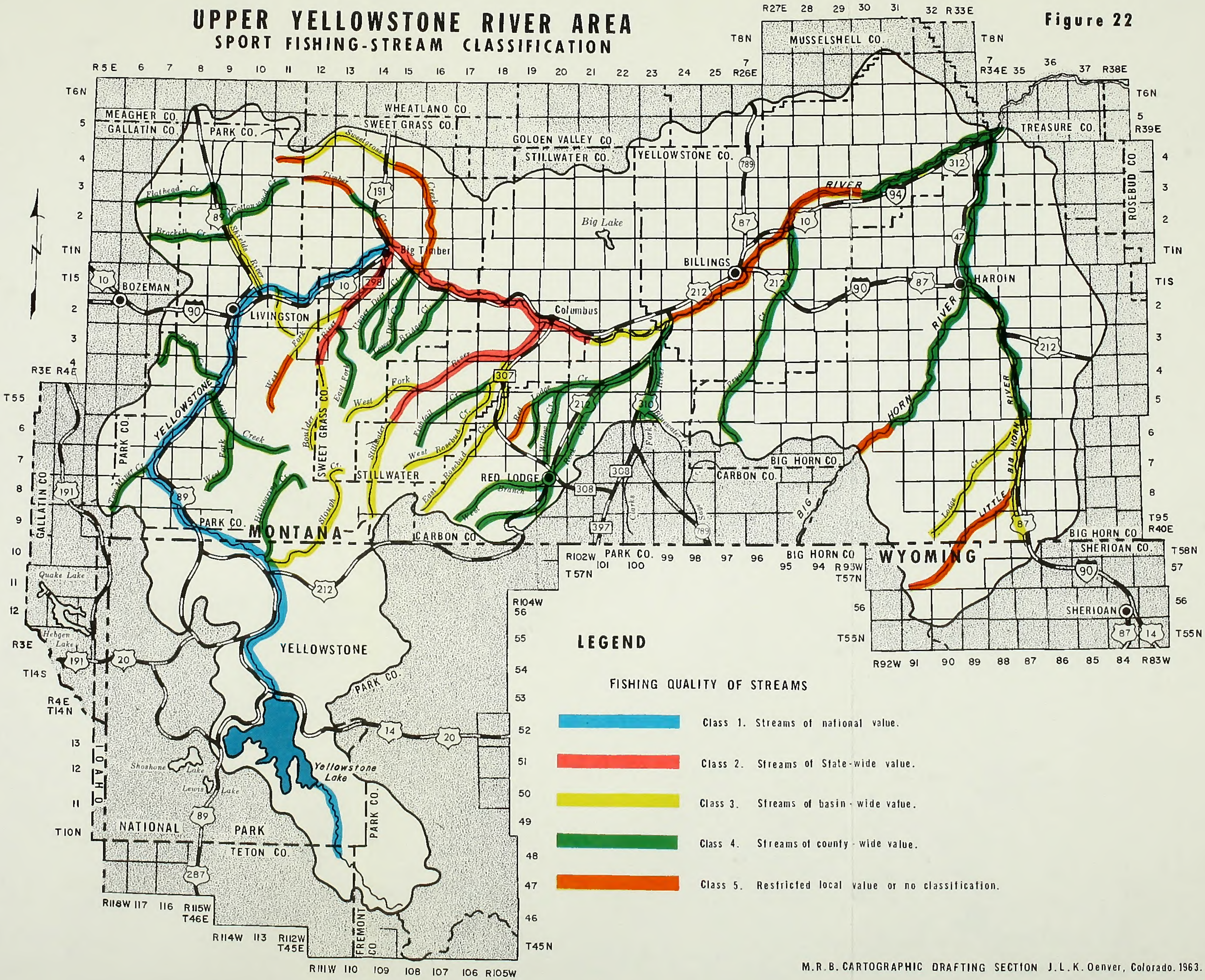
A substantial value of the Yellowstone River is as a breeding ground for wildlife. Beaver, mink, muskrat and numerous ducks and rookeries of blue heron are found. The river is of especial significance for water fowl breeding. Downstream from Billings, hundreds of Canadian geese produce one or two hatches annually on the banks of the river's numerous small islands.

Public Domain Lands and Recreation

The public domain of the Bureau is limited in the sub-basin. But many tracts by virtue of that fact alone assume key roles for public access to major streams for fishing and boating, or to large

Figure 22

UPPER YELLOWSTONE RIVER AREA
SPORT FISHING-STREAM CLASSIFICATION



LEGEND

FISHING QUALITY OF STREAMS

🟦 Class 1. Streams of national value.

🟥 Class 2. Streams of State-wide value.

🟨 Class 3. Streams of basin-wide value.

🟩 Class 4. Streams of county-wide value.

🟧 Class 5. Restricted local value or no classification.

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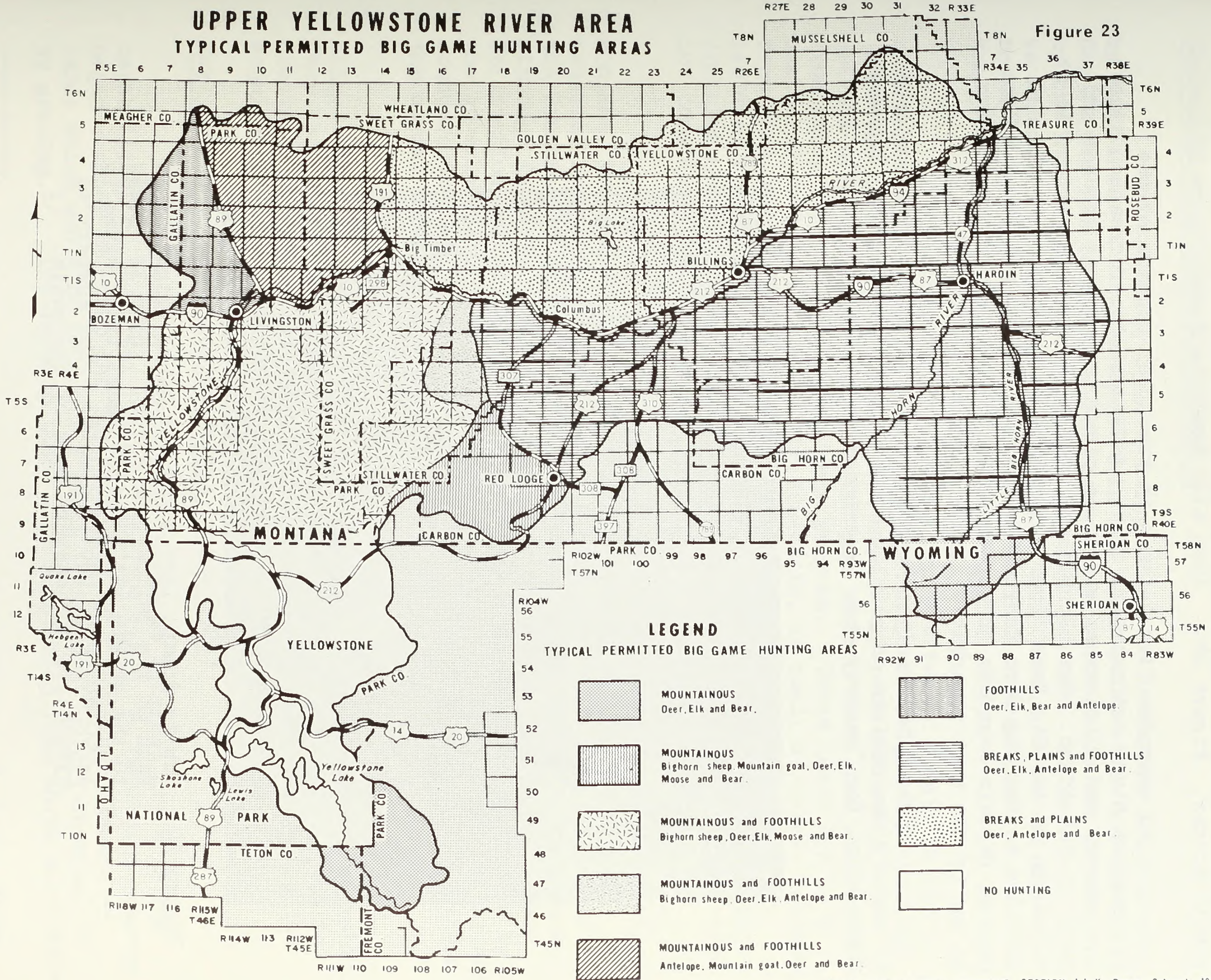
Figure 23

UPPER YELLOWSTONE RIVER AREA
TYPICAL PERMITTED BIG GAME HUNTING AREAS



LEGEND
TYPICAL PERMITTED BIG GAME HUNTING AREAS
MOUNTAINOUS Deer, Elk and Bear.
MOUNTAINOUS Bighorn sheep, Mountain goat, Deer, Elk, Moose and Bear.
MOUNTAINOUS and FOOTHILLS Bighorn sheep, Deer, Elk, Moose and Bear.
MOUNTAINOUS and FOOTHILLS Bighorn sheep, Deer, Elk, Antelope and Bear.
MOUNTAINOUS and FOOTHILLS Antelope, Mountain goat, Deer and Bear.
FOOTHILLS Deer, Elk, Bear and Antelope.
BREAKS, PLAINS and FOOTHILLS Deer, Elk, Antelope and Bear.
BREAKS and PLAINS Deer, Antelope and Bear.
NO HUNTING
MONTANA
WYOMING
IDAHO
MEAGHER CO
WHEATLAND CO
SWEET GRASS CO
GOLDEN VALLEY CO
STILLWATER CO
YELLOWSTONE CO
MUSSELSHELL CO
TREASURE CO
ROSEBUD CO
PARK CO
GALLATIN CO
CARBON CO
BIG HORN CO
SHERIDAN CO
TETON CO
FREMONT CO
BOZEMAN
LIVINGSTON
Big Timber
Columbus
BILLINGS
HARDIN
RED LODGE
SHERIDAN
YELLOWSTONE NATIONAL PARK
Yellowstone Lake
Shoshone Lake
Lewis Lake
Hebgen Lake
Quake Lake
Big Lake
YELLOWSTONE RIVER
BIG HORN RIVER
LITTLE BIG HORN RIVER

M.R.B. CARTOGRAPHIC DRAFTING SECTION J.L.K. Denver, Colorado 1964.

Black

areas of the public lands for hunting and fishing. The Bureau of Land Management has, therefore, set aside a number of these tracts for public access. Figure 24. (See also Appendix B and figure 32).

As examples five islands in the upper reaches of the Yellowstone River demonstrated their usefulness for recreation sites for boaters and floaters as midstream picnic or camping grounds and were so classified. One such island, set aside for recreation, is at the mouth of the Big Horn River. Another is the public domain included in the Big Horn Canyon Recreational Area. Of the Big Horn Canyon, Captain Raynolds on September 8, 1859, wrote: "...the cañon is one of the most remarkable sights upon this continent..."

Many of the isolated tracts of public domain will continue to satisfy the desires of people, as quoted by Montana State Highway Commission, for "variety, new experience, curiosity, novelty".

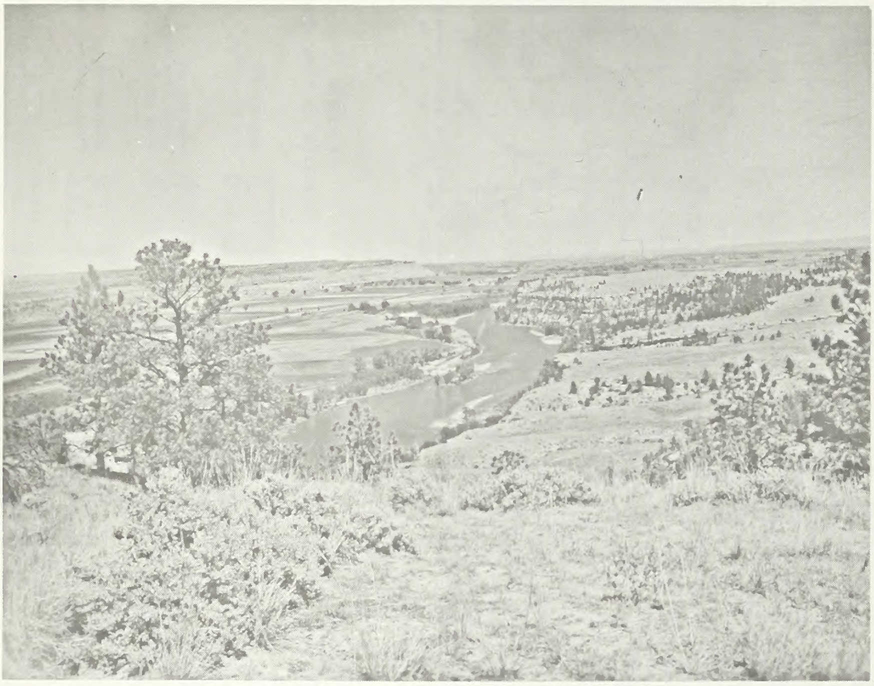


Figure 24: Public domain lies along the south (right-hand) bank of the Yellowstone River. Here is access to the stream and possible small tract sites in 1,000 acres of public domain. The scenery is typical of the eastern part of the basin.

THE PUBLIC LANDS

Characteristics and Administration

Approximately 134,000 acres of public lands are administered by the Bureau of Land Management in the Upper Yellowstone sub-basin. See figure 25. The use and disposition of these lands are governed by the Taylor Grazing Act of June 28, 1934 (48 Stat. 1272; U.S.C. 315), as amended, and other applicable public land laws. A recent law of marked significance in their administration is the Multiple Use Management Act of September 19, 1964 (78 Stat. 988).

Of the total area, 62,000 acres are public domain in the true sense of the word. These are federal lands originally acquired under the Louisiana Purchase, which have never been alienated to private use through operation of the public land laws, nor withdrawn from entry for a federal management program. These lands lie in a scattered pattern throughout the sub-basin, in small acreages, isolated from each other. This isolation gives them their common name -- isolated tracts. By definition of the Taylor Act, an isolated tract contains not more than 1,520 acres. Larger, contiguous acreages are not considered to be isolated.

At the eastern end of the sub-basin, in Yellowstone County, Montana, there are 72,000 acres once privately owned, which were acquired by the federal government during the 1930's under terms of the Bankhead-Jones Act. These lands are in reasonably compact form, although far from contiguous, and are the component parts of a "Land Utilization Project". They were sub-marginal farmlands purchased by the government to take unsuitable land out of production and to relieve economic distress. These acquired lands are not public domain within the normal definition.

In one respect the isolated tracts and acquired lands are alike; these two groups stand on the bottom rung of economic desirability. They have a general physical difference, however, in that the public domain is characterized by steep slopes and shallow soils, while the acquired lands are reasonably level, with better soils.

Earlier Land Classification System (circa 1924)

In the period 1890 - 1920 intensive interest arose in the capabilities of the Great Plains. In 1924 the U. S. Geological Survey began a study to group the public domain into three use classes -- lands which would be productive under irrigation, by dry-farming, or by grazing.[1] Dry-farming lands were subdivided into three sub-classes;

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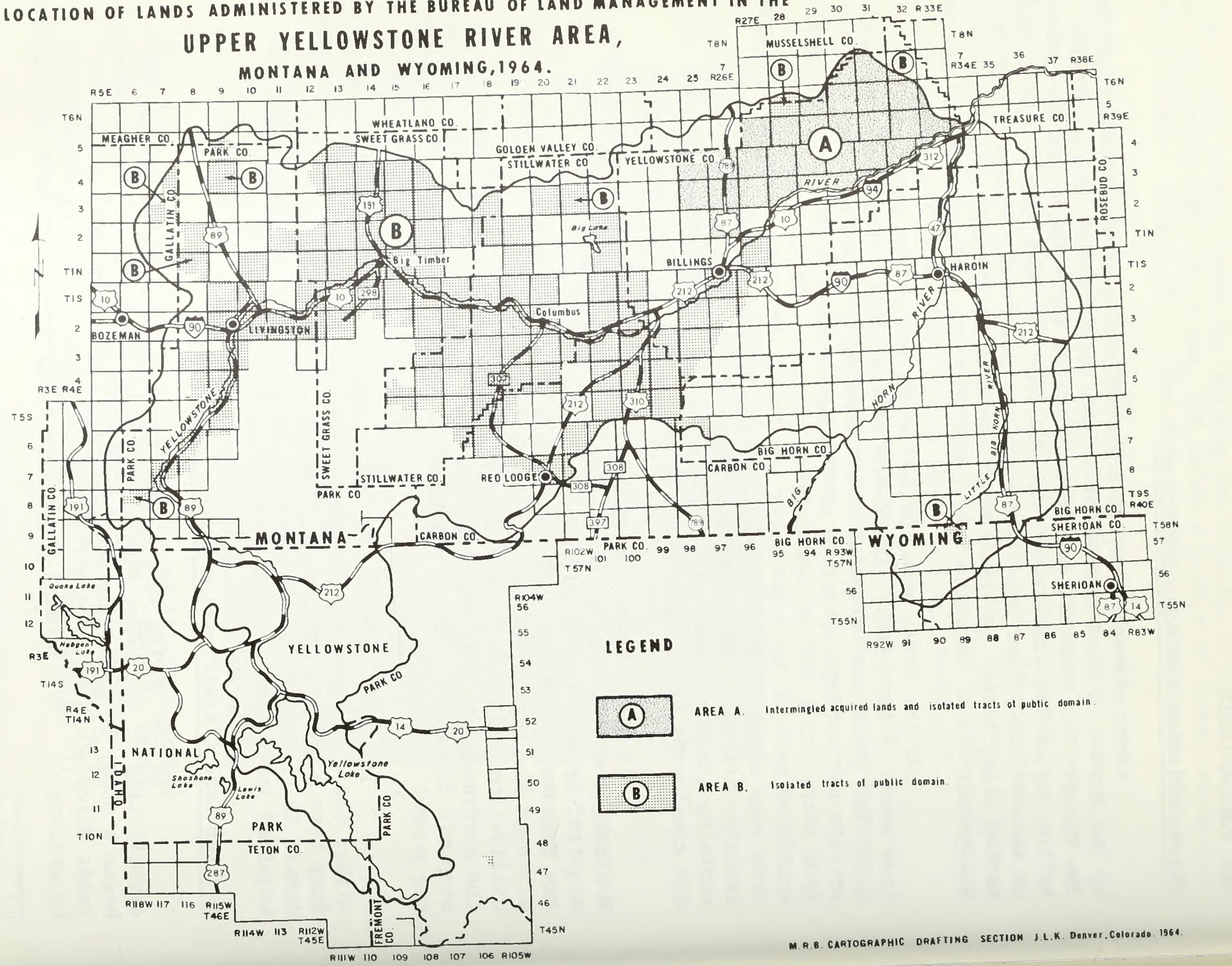
[1] Land Classification of the Northern Great Plains, Montana, North Dakota, South Dakota, and Wyoming, U. S. Geological Survey 1929. Unnumbered.

Figure 25

LOCATION OF LANDS ADMINISTERED BY THE BUREAU OF LAND MANAGEMENT IN THE

UPPER YELLOWSTONE RIVER AREA,

MONTANA AND WYOMING, 1964.



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farming, farming-grazing, and grazing-forage lands. Grazing lands were subdivided into two sub-classes; tillable and non-tillable lands. Standards of soil, topography and productivity were assigned to each class. National Forest and Parks were excluded. A map, figure 26, summarizes the findings of the Geological Survey report.

Range Vegetation in Land Classification (1924) 1/

The vegetation was divided into characteristic associations of forage or non-forage plants. In computing carrying capacity the Geological Survey estimated a grazing season of from 5 to 7 months yearly. Their figures given in animal units per section are generalizations and have been converted to the more common "acre per animal unit month"(A/AUM), to aid comparison with recent findings.

Plant cover associations described by the Geological Survey were as follows: (Common names are listed in Appendix E.)

Grama grass association, a predominantly short-grass type found on the farming-grazing land, with a carrying capacity of 3½ to 6½ A/AUM.

Grama and needlegrass association, a more productive type, with a carrying capacity of 1½ to 3½ A/AUM.

Grama and threadleaf sedge association, an important indicator of deficient soil moisture on shallow, rocky or gravelly soils; carrying capacity of 3½ to 6½ A/AUM, and usually classed as farming-grazing land.

Grama and western wheatgrass association, characteristic of the heavy clay loams, usually indicating farming-grazing or grazing-forage land; carrying capacity of 2½ to 4 A/AUM.

Grama and mountain sage association, characterized soils with moisture in excess of the amount required for grama grass alone; classed as farming-grazing land with carrying capacity of 3½ to 7 A/AUM.

Grama and matchweed association, generally found on the tillable grazing land, with carrying capacity of 6½ to 12 A/AUM.

Grama and valley sage association. Found on deep, well drained soils capable of cultivation; carrying capacity of 2½ to 4 A/AUM.

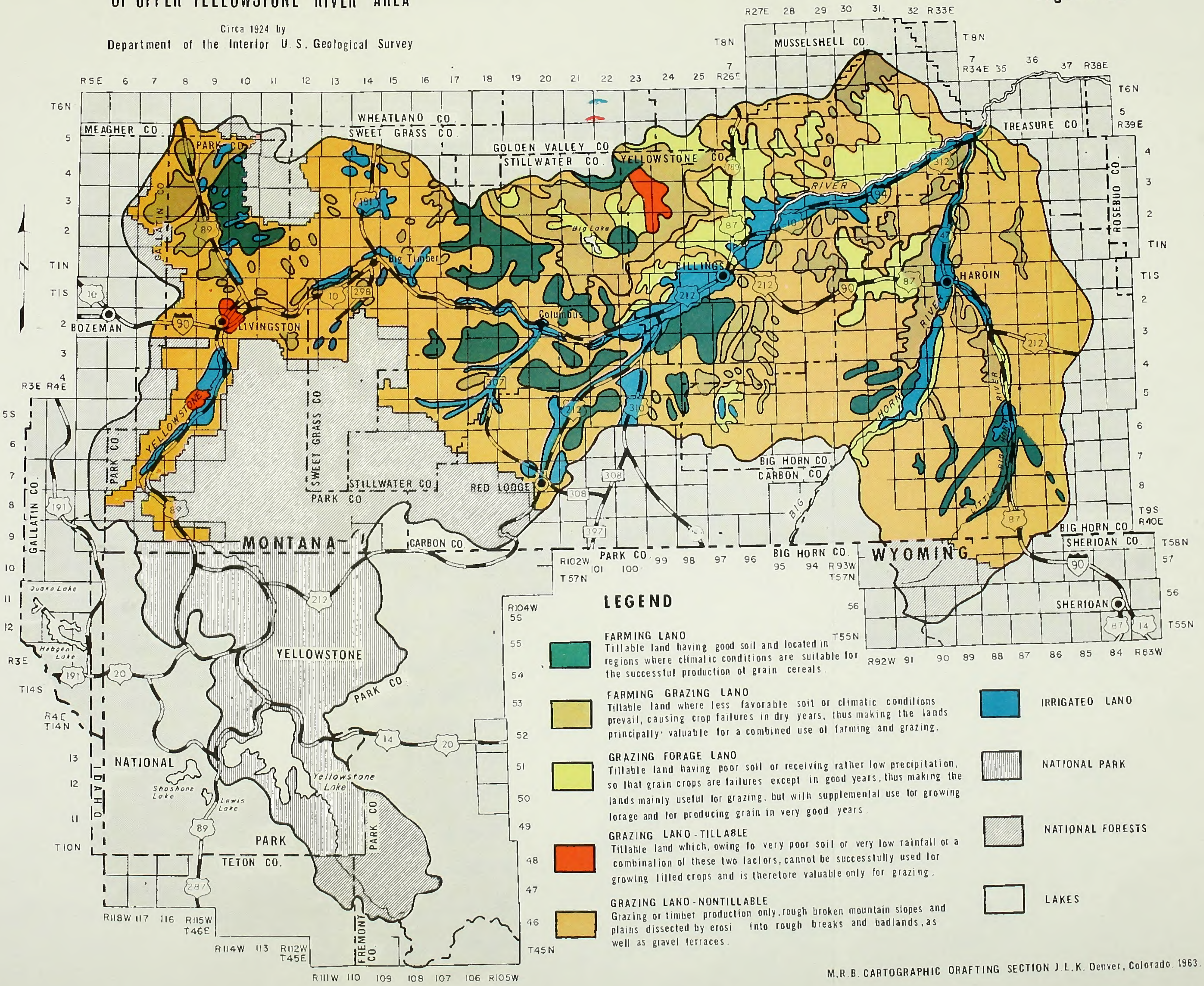
Grama and buffalo grass association, similar to grama grass alone, but indicative of crop failure during years of less than average rainfall; carrying capacity of 4 to 6½ A/AUM.

1/ Common plant names of 1924 have modern synonyms in Appendix E.

GENERALIZED SUMMARY OF EARLIEST OVERALL LAND CLASSIFICATION OF UPPER YELLOWSTONE RIVER AREA

Circa 1924 by
Department of the Interior U. S. Geological Survey

Figure 26



LEGEND

🟩 **FARMING LAND**
Tillable land having good soil and located in regions where climatic conditions are suitable for the successful production of grain cereals.

🟫 **FARMING GRAZING LAND**
Tillable land where less favorable soil or climatic conditions prevail, causing crop failures in dry years, thus making the lands principally valuable for a combined use of farming and grazing.

🟨 **GRAZING FORAGE LAND**
Tillable land having poor soil or receiving rather low precipitation, so that grain crops are failures except in good years, thus making the lands mainly useful for grazing, but with supplemental use for growing forage and for producing grain in very good years.

🟥 **GRAZING LAND - TILLABLE**
Tillable land which, owing to very poor soil or very low rainfall or a combination of these two factors, cannot be successfully used for growing tilled crops and is therefore valuable only for grazing.

🟧 **GRAZING LAND - NONTILLABLE**
Grazing or timber production only, rough broken mountain slopes and plains dissected by erosion into rough breaks and badlands, as well as gravel terraces.

🟦 IRRIGATED LAND

▥ NATIONAL PARK

▨ NATIONAL FORESTS

☐ LAKES

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Grama, buffalo and western wheatgrass association, usually found on the farming-grazing or grazing-forage land; carrying capacity of 4 to 6½ A/AUM.

Western wheatgrass association, lower grazing value, with carrying capacity of 5½ to 6½ A/AUM.

Sagebrush association, classed as grazing-forage and grazing lands, with carrying capacity of 6 to 9 A/AUM.

Forest association, provided occasional grazing, but regarded as of low carrying capacity.

Saltgrass association, regarded as indicative of soils containing sufficient alkali to preclude production of dry land crops.

Land Classification By County (1924)

Excerpts from the 1924 Geological Survey Land Classification study report which are useful for comparison with the present findings:

Big Horn County

> "The soil ranges from clay loam to sandy loam over most of the area mapped as tillable. In the Big Horn River Valley the soil generally is somewhat heavy, ranging from clay to clay loam, and most of the river valleys have a similar soil. Some of the heavy-soil bottom lands are strongly alkaline. The eastern part of the county has numerous red scoriaceous or clinker-like hills formed by the burning of coal beds, and soils in many places in this area are mixed with particles of this clinker formation. The vegetation of the clay-loam and sandy-loam benches is of a grama and needlegrass type, which is mixed with western wheatgrass on the heavier soil and with nigger wool on the lighter. Black sage and wheatgrass are the dominant species of the heavy clay soils, and the alkaline soils support a growth of saltgrass and greasewood. Valley sage is conspicuous in deep loam soils that have a favorable amount of moisture. Matchweed is scattered over shallow soils or overgrazed areas, and mountain sage grows on abandoned plowed lands. Little bluestem is conspicuous in the scoria areas of the eastern part of the county and elsewhere on steep sandy or rocky slopes. Sandgrass is found in some places with little bluestem and also occurs in bunches scattered over the light sandy soils of the county.
>
> The total area of the county is 3,209,000 acres of which 3 percent is classified as irrigated land, 3 percent as farming

land, 8 percent as farming-grazing land, 6 percent as grazing-forage land, and 80 percent as grazing land. The irrigated land is used mainly to produce hay--chiefly alfalfa and native wheatgrass, both of which yield well. About 80 percent of the entire county is classified as valuable only for grazing.

The livestock industry is the outstanding one."

Carbon County

"The principal river valleys are along the Clark Fork and its tributary Rock Creek. The Yellowstone River forms part of the north boundary of the county and the Big Horn River part of the east boundary, but the valley areas along these streams within the county are negligible. The soil ranges from sandy loam to gumbo. The dominant vegetation is a grassland type in which the principal species are wheat bunch grass, grama grass, western wheatgrass, bluegrass, mountain timothy, and rye grass. In the western part of the county a number of mountain weeds are found associated with the grass, among which are larkspur, lupine, locoweed, balsam root and yellow dock. Black sage and valley sage are prominent shrubs on the better farming lands, and matchweed, as well as nigger wool in many places thrives on soils having a relatively low supply of moisture. Yellow pine, scrub fir, cedar and pinion are found in places. The mean annual rainfall ranges from 10 to 20 inches, the locality receiving the least rainfall being in the southeastern part of the county and that receiving the most extending from Red Lodge southwestward. The growing season ranges from 80 to 125 days.

The area of the county is 1,335,000 acres, of which 7 percent is classified as irrigated, 5 percent as farming land, 1 percent as farming-grazing land, 3 percent as grazing-forage land, 60 percent as grazing, and 24 percent is in National forests. The grazing period is from four to seven months, and the carrying capacity of the land ranges from 10 to 50 animal units to the square mile.

Park County

"The soil on the areas mapped as farming, and farming-grazing land is mainly a fine to medium textured clay loam and sandy loam. In the Yellowstone River Valley the soil contains varying amounts of waterworn gravel, and the areas having that kind of soil are essentially classified as tillable grazing lands unless irrigated. Near the mountains in the Shields Valley is a dark-colored loam soil. The vegetation on the gravelly-loam soils is of a grama and nigger wool type with secondary species consisting of matchweed, mountain sage, and wheatgrass. On the clay-loam soils of the Shields Valley sagebrush and wheat bunch grass dominate, with grama, wheatgrass, needlegrass, and mountain sage as secondary species. On the higher slopes the forest type dominates and the chief timber species are scrubby western yellow pine, lodgepole pine, Douglasfir, and quaking aspen. Along the main watercourses a dense growth of cottonwood and willows is found. Well-drained slopes that have good soil have a shrub type consisting of various mountain brush species and an undergrowth of lupine, locoweed, wheat bunch grass, and wild geranium. In abandoned cultivated areas fanweed, sunflower, black mustard, and mountain sage are important species. The mean annual rainfall ranges from 14 to 25 inches and the growing period averages about 125 days. The county has an area of 1,722,000 acres, of which 7 percent is irrigated, 3 percent is classified as farming land, 6 percent as farming-grazing land, 1 percent as grazing-forage land, 27 percent as grazing land, and 56 percent is in national forest."

Stillwater County

"The soil on the uplands is a fine-textured clay loam. In Lake Basin, a clay-loam to clay soil predominates. In the center of the basin there is an accumulation of alkali in a heavy clay soil. The stream valleys have a gravelly-loam to silt-loam soil. The vegetation on the uplands is of a grama and western wheat grass type. Secondary species consist of valley sage, wheat bunch grass, needlegrass and various weeds, of which lupine, balsam root, and locoweed are the principal species. On the lower foothills and well-drained north slopes a transition shrub type dominates. Yellow pine, fir,aspen, and lodgepole pine are found on the crests of ridges and on the outer margins of the plains. On the alkaline soils of Lake Basin a salt-grass type is dominant and is associated with more or less greasewood and western wheat grass. The precipitation is about 16 inches during a normal year, and the average growing season ranges from 90 to 120 days.

The county has an area of 1,148,000 acres, of which 4 percent is irrigated, 17 percent farming land, 18 percent farming-grazing land, 4 percent grazing-forage land, 40 percent grazing land, and 17 percent in national forests. About 213,000 acres, nearly half of the potential farm land, was classified as crop land in 1924. Approximately 21 percent of the crop land is irrigated and lies mainly in the narrow valleys of the Yellowstone and Stillwater River and

Fishtail and Rosebud Creeks. The principal grazing areas lie in the region south of the Yellowstone River. The grazing season extends over a period of five to seven months, and the carrying capacity ranges from 20 to 50 animal units per square mile. The livestock in the county on January 1, 1925, was equivalent to about 25 animal units to the square mile of noncrop land."

Sweetgrass County

"The surface of Sweetgrass County consists mainly of rough rolling uplands and hills extensively dissected by deeply intrenched drainage channels, with more or less isolated areas of smooth to gently sloping bench lands. The principal stream is the Yellowstone River which flows eastward approximately through the center of the county.

Along the streams the soil is a gravelly loam to silt loam. On the interstream areas the prevailing soil type is a fine-textured clay loam with some local patches of gumbo. Near the eastern boundary of the county on small terraces north of the Yellowstone River, the soil is mainly a fine-textured sandy loam. On the rolling bench lands and the lower foothills the vegetation is mainly a grama and western wheatgrass type with secondary species which include wheat bunch grass, blue grass, and sagebrush, as well as several weeds such as locoweed, lupine, and death camas. On the well-drained slopes in the lower foothills regions a shrub type associated with grass and weeds is dominant. Scrubby yellow pines are found in the areas bordering national forests and on rounded hills, escarpments, and the crests of some of the ridges. Altitudes in the county range from 3,742 to more than 11,000 feet. The mean annual rainfall ranges from 15 to 20 inches and the growing season from 70 to 138 days.

The county has an area of 1,193,000 acres, of which 5 percent is irrigated, 3 percent is classified as farming land, 8 percent as farming-grazing land, 1 percent as grazing-forage land, 57 percent as grazing land, and 26 percent as national forest land. About 105,000 acres or 53 percent of the potentially tillable land was in cultivation in 1924. Nearly every stream has some irrigation along its valley, but most of the irrigated land is found along the Yellowstone and Boulder Rivers, and Sweetgrass Creek. Dry farming is practiced mainly along the eastern and northern borders of the county. The large amount of grazing land affords excellent summer range. Normally the grazing period is about four months in the national forests and seven to eight months in the lower valleys. The carrying capacity ranges from 20 to 50 animal units per square mile."

Yellowstone County

> "The present flood plain of the Yellowstone River has a coarse gravelly to fine textured clay soil. An area of about 100 square miles in the northwestern part of the county surrrounding Comanche has a heavy clay soil which is poorly drained and contains some alkali. This area is mapped as tillable grazing land. Other local tracts of similar character occur but are too small to be mapped. Elsewhere on the uplands and the terraces representing old bottom lands the soil ranges from a coarse sandy loam of shallow depth to fine textured clay loam and some isolated patches of gumbo. On the crests of some ridges, the soil is gravelly.
>
> The vegetation on the uplands is of a grama and wheatgrass, grama and needlegrass, or shrub type. On the steeper slopes and in much of the rolling country a forest type prevails, the dominant species of which is yellow pine, locally called bull pine. On the poorly drained alkaline flats the saltgrass type is dominant. Secondary species in the grama and wheat grass areas are wheat bunch grass, black sage and nigger wool. The grama and needlegrass type has a principal associated wheat bunch grass, valley sage, lupine and larkspur. The shrub type on the fine sandy loam soils is dominated by valley sage and usually has an undergrowth of grasses, such as grama grass, needlegrass, and giant wild rye. The shrub types on the heavy soils is dominated by black sage, and the principal associated species is wheatgrass. The saltgrass type includes chiefly wheat grass, greasewood, and black sage. The mean annual rainfall ranges from 13 to 20 inches, and the growing season averages about 135 days.
>
> The area of the county is 1,670,000 acres, of which 8 percent is irrigated, 3 percent has been classified as farming land, 15 percent as farming-grazing land, 24 percent as grazing-forage land, and 49 percent as grazing land. The number of range livestock in the county is equivalent to 54,400 grazing animal units, or about 25 animal units to the square mile of noncrop land, the amount of land in the county is about 15 acres for each grazing animal unit. The average grazing period is six to seven months each year, and the carrying capacity of the land ranges from 15 to 40 animal units to the square mile."

The report from which the above remarks were taken is notable for the applicability of most of its remarks even today. The vegetation has changed little, the soils hardly at all. The percentages of cropland have changed, but not drastically. This report, published in 1929, is still a sound generalization of soil, vegetation, topography, and land capability.

Range Vegetation Characteristics (Current)

The 134,000 acres of land administered by the Bureau of Land Management on both the public domain and the acquired lands have vegetation similar to the entire basin. 1/

Grassland covers 94,000 acres for 71 percent of the total area of the two land groups; sagebrush dominates 11,000 acres for 8 percent of the area; conifers dominate over 11,000 acres or 9 percent. Range types depend on aspects; timber types on species. Thus a forest type with a light stand of commercial poles might be classed as a grassland range type with scattered timber. Roughly one-half of the public domain has a tree cover of some sort. Grass reseedings, found only on acquired lands, dominate over 13,000 acres roughly 10 percent. The remaining acreage, 2 percent of the land, would be water surface or barren.

Acquired lands total roughly 72,000 acres, of which at least 15,000 acres have been restored to permanent vegetation. Over 77 percent of the total acreage is grassland range; grass reseedings add another 19 percent, thus roughly 98 percent of the acquired land is principally grassland. The remaining acreage, two percent of the total, is negligible; sagebrush covers less than 500 acres, conifers a little over 800 acres.

Isolated tracts of public domain aggregate 62,000 acres with nearly 40,000 acres in grasslands, approximately 64 percent of the total. The remainder, 36 percent, is divided equally between sagebrush and conifer.

Public Domain by County

Note: Range types are mapped by aspect. Scattered timber either commercial or noncommercial is often included as a species within a range writeup and the timber written up as necessary notes. Thus acreage of timber types and range types mapped separately cannot agree.

Yellowstone County has roughly 11,500 acres of isolated tracts. Musselshell County, included here for convenience, has one isolated tract of 160 acres. The principal forage species are, in order:

1/ Yellowstone County is the only county with both public domain and acquired lands. Part of the isolated tracts are included in Area A of figure 25, 7,900 acres. The remainder, 3,600 acres, are scattered throughout the County. The location of acquired lands defines the boundaries of Area A. Public domain and acquired lands are discussed separately in this account.

bearded bluebunch wheatgrass, prairie junegrass, needleandthread, blue grama, and threadleaf sedge. Grassland range type has by far the largest acreage, 7,500, with an average carrying capacity of 5.7 acres per AUM. Sagebrush range type is next in importance with nearly 3,000 acres and an average carrying capacity of 6.7 acres per AUM. Pole-sized timber on roughly 3,700 acres is scattered. Only 200 acres of range had timber sufficiently dense to class as a timber range type, its understory was rated at an average carrying capacity of 7.0 acres per AUM.

Carbon County has nearly 10,000 acres of isolated tracts. The principal forage species are bearded bluebunch wheatgrass, blue grama, big sagebrush and needleandthread. Grassland and sagebrush ranges are almost evenly divided at 5,000 acres each. Grassland is rated at 5.9 acres per AUM on the average. Sagebrush range had a slightly lower carrying capacity of 6.3 acre land. Rangeland dominated by pine or juniper, a little over 300 acres, was estimated at 7.0 acres per AUM, 120 acres were valuable solely for commercial timber. The remaining timbered areas were included into range types.

Sweetgrass County has the largest acreage of isolated tracts in the Upper Yellowstone Basin -- over 18,000 acres. The principal forage plants are bearded bluebunch wheatgrass, prairie junegrass, needleandthread, Idaho fescue and bluestem wheatgrass. Its rangeland of roughly 11,000 acres is dominated by grassland range types, with an average carrying capacity of 3 to 3.3 acres per AUM. The next most common range cover is that of conifer-dominated grazing land, with about 5,000 acres; its carrying capacity drops to 9.5 to 10 acres per AUM. Sagebrush with an average carrying capacity of 5 to 5.5 acres per AUM covers over 1,000 acres. Wildlife can use 210 acres of feed that are waste range for livestock. Browse, with a carrying capacity of 7 acres per AUM for livestock dominates 85 acres. Commercial timber -- Douglasfir, lodgepole pine, and ponderosa pine-- was inventoried on 1,385 acres. Range types which were dominantly timber included 1,500 acres of commercial timber and 4,000 of noncommercial timber. This total of 5,500 acres were considered as timber types by the Billings District in their forest inventory.

Stillwater County has about 9,000 acres of isolated tracts. The principal forage is bearded bluebunch wheatgrass, needleandthread and prairie junegrass. The largest acreage, about 5,000 acres, is grassland range type with a carrying capacity of 4.5 acres per AUM. Lodgepole pine and ponderosa pine dominate approximately 2,600 acres with a much lower forage production of 13.5 acres per AUM. Dense commercial forest land with Douglasfir, ponderosa pine, lodgepole pine and some lower-grade cottonwood and aspen covered approximately 400 acres. Sagebrush, with a carrying capacity of 6.4 acres per AUM, covers 500 acres. Forty acres of dry meadow have a carrying capacity of 2.5 acres per AUM. Insignificant acreages of waste land

and greasewood-dominated flats have negligible forage. The District's total for all commercial timber, which naturally includes some of range types, was 1,670 acres; and noncommercial timber covered 2,630 acres. About 1,300 acres of this timber were placed in range forage types.

Park County has approximately 12,500 acres and Gallatin and Meagher Counties approximately 500 acres of isolated tracts. The principal forage species are bearded bluebunch wheatgrass, western wheatgrass, Idaho fescue and needleandthread. Grassland range type dominates 8,600 acres, with an average carrying capacity of 5.7 acres per AUM. Conifers dominate 200 acres with a carrying capacity of 9.5 acres per AUM. Sagebrush range accounts for a little less than one thousand acres with an average carrying capacity of 6.4 acres per AUM. Over 1,100 acres produce commercial timber with no range forage. The remaining 1,900 acres of commercial timber were classed in range types.

Acquired Lands

The 72,000 acres of acquired lands of the Bureau are confined to Yellowstone County. At least 15,000 acres, once cultivated, were reseeded; 13,000 acres are still dominated by introduced grass species, the remaining 2,000 acres have returned to native perennial plants. The principal forage species on the acquired lands are bearded bluebunch wheatgrass, crested wheatgrass, blue grama and needleandthread. The principal use is grazing.

Grassland is most commonly encountered -- 55,000 acres, on which the carrying capacity is 7.1 acres per AUM. Ponderosa pine dominates 860 acres, which, because of steep slopes and lessened production under the trees, has a carrying capacity of 10 acres per AUM. Nearly 1,000 acres has no grazing value for livestock but those wildlands with a coniferous overstory usually have cover and forage favorable for wildlife, especially deer.

Juniper-dominated ridges cover 9,000 acres with a carrying capacity of 6.7 acres per AUM. Cottonwoods dominate 75 acres of river-bottom with no carrying capacity. Annuals, mainly grasses, on 150 acres of rangeland have a negligible carrying capacity. The reseeded rangeland (crested wheatgrass) about 13,000 acres, has an average carrying capacity of 4.4 acres per AUM. The acquired lands, as a whole, average a carrying capacity of 5.9 acres per AUM.

Range Condition

The most sensitive and accurate indicator of range condition is the total plant cover.

The ecological method of range survey, the system used in this inventory, evaluates the plant cover by dividing the rangeland into range sites -- bottomlands, uplands, saline flats, etc. In practice, the range site is established by a mappable difference in soil depth, salinity, texture, permeability, topography, etc. The vegetation which was the original or undisturbed plant cover for each particular site is decided from studies on protected or well-managed rangeland. Condition is then inferred by any departures from the original plant cover. Range condition so derived is expressed as one of four classes, "Excellent" condition is in close accord with its original plant cover. The next lower class, "Good" represents small changes in which certain of the original plants have been replaced. Lower condition groups are termed "Fair" and "Poor" and represent successively greater departures from the original.

Considering the typical range, the higher classes of "Excellent" and "Good" have the more desirable perennial grasses and forbs. Forage production is greater. Soil cover of mulch or litter will, however, vary with climate and site. Thinly-vegetated, steep slopes and lack of mulch on a "Badlands" range site could represent the highest range condition possible for "Badlands". In "Fair" and "Poor" condition, forage production is lowered, because the plants are usually low-growing and many are rejected by livestock.

"Fair" ranges are still relatively productive. Their forage can be the most favorable for economic livestock production,1/ thus, the statement "Fair" does not represent a dangerously low supply of forage.

In the lowest condition class of a site, "Poor", the perennial forage plants of the original plant cover may be replaced wholly or in part by plants such as pricklypear cactus or annuals. (See Appendix C for details of this method of range inventory).

Range Condition of the Public Domain

Range condition was determined for 93 percent of the area of these isolated tracts. Timbered, barren, or water surface, amounting to 7 percent, a little over 4,000 acres was not rated. Of the area rated, 2 percent was in "Poor" condition; 20 percent in "Fair" range condition; and by far the largest acreage, 63 percent, in "Good" condition. In addition, 8 percent of the range acreage was in the top bracket of "Excellent".

1/ Under special conditions certain grasses may be inferior in quality to those of the original cover, but may furnish feed at a critical time of year -- thus, they, and that portion of the range in "Fair" condition, may both be desirable.

Thus, nearly three-fourths of the public domain tracts were producing range forage above average. See figure 27.

Range Condition of the Acquired Lands

Approximately 15,000 acres of rangeland of the acquired lands were reseeded to introduced grasses. Most of this nearly 13,000 acres, is covered with crested wheatgrass. Native grasses have re-established on 2,000 acres and they were judged for range condition as though they were native range.

On the acquired lands, 9 percent were in "Excellent" range condition; 36 percent were in "Good" condition, and this amount, plus the 18 percent in regrassed cropland which is its equivalent, gives a total of 54 percent in "Good" condition. Thirty-two percent were in "Fair" condition, and 5 percent in "Poor"condition. Thus, 63 percent of the acquired lands were above average in range condition. See figure 27.

Soil Erosion

Accelerated soil erosion is erosion at an unusual rate. Very often, accelerated soil erosion is man-caused -- by cultivation, too early grazing, or overstocking, lumbering, fire, or by concentration of water from roads or similar agencies which remove or weaken the protective cover of the soil. Erosion is a major problem because soil loss is not reversible; it is difficult to obviate erosion's bad effects.

Soil removal by erosion is shown by one of four classes which reflect varying amounts of topsoil loss. Class 1 represents none to slight erosion. This would, as encountered in the field, be almost undetectable. Class 2 erosion is readily apparent in field examination -- soil loss may equal three-fourths of the "A" horizon of a mature soil, or, in a structureless soil, three-fourths of the top five inches; rills are widespread, small gullies common. Class 3 erosion is moderate to severe soil loss. In this class, the "A" horizon is gone (about five inches of soil in the climate of Area A). Gullies are large, deep and impossible to cross with farm machinery. Class 4, severe erosion, was not encountered in this study.

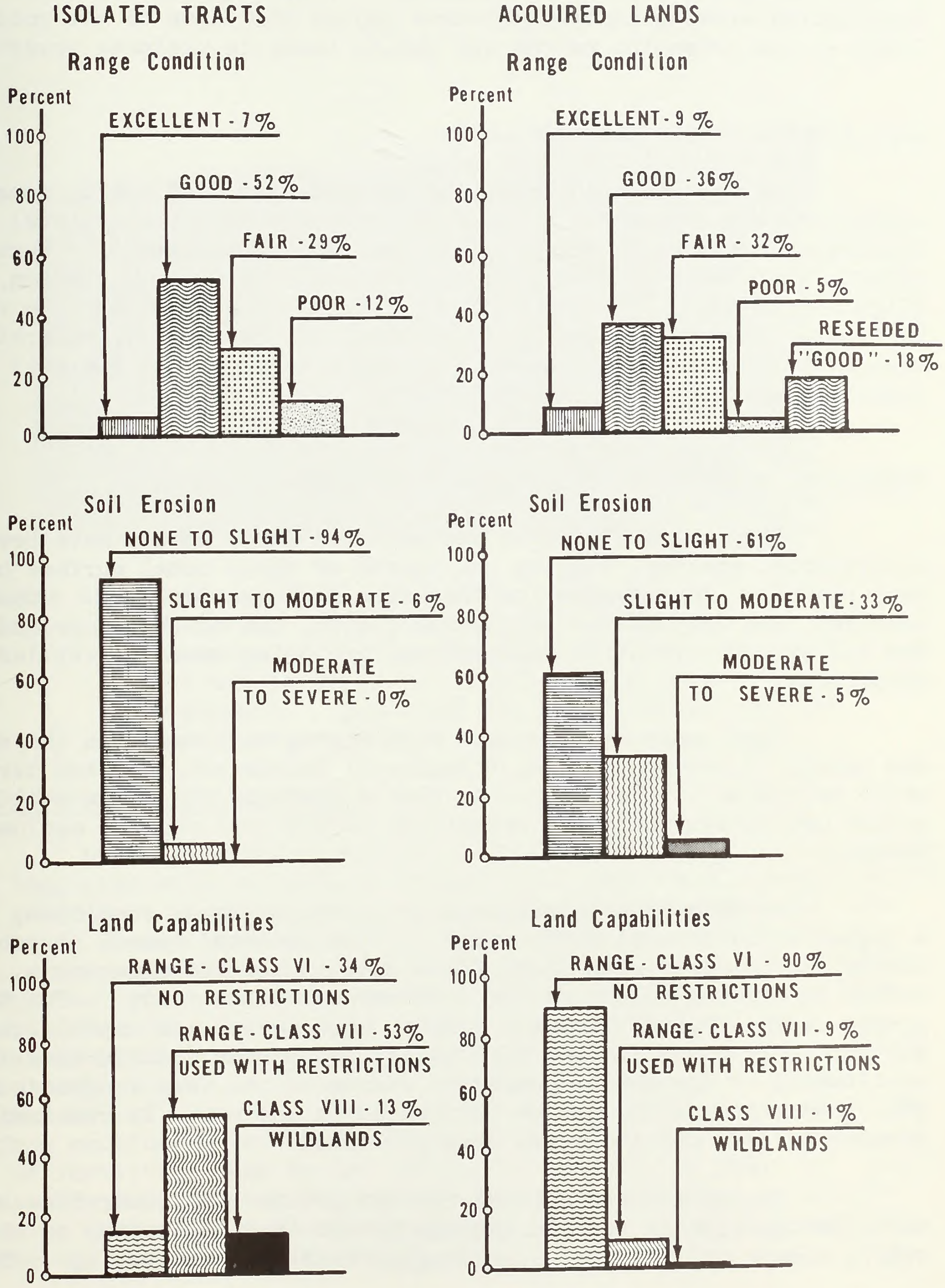
Soil Erosion on the Public Domain

Of the public domain, over 78 percent is in Class 1 -- none to slight accelerated erosion. Figure 27. Approximately 21 percent is in Class 2 of slight to moderate erosion, and only a trifle over 1 percent, about 700 acres, is in Class 3 of moderate to severe erosion. This is not unexpected, because of the perennial grass or timber cover

Figure 27

RANGE CONDITION, ACCELERATED SOIL EROSION and LAND CAPABILITIES in TWO GROUPS of PUBLIC LANDS.

UPPER YELLOWSTONE RIVER AREA, MONTANA. 1964.



on most of the public domain. However, geological erosion may show up because of topography, such as badlands with no soil formation which will, on occasion, contribute to acceleration of erosion. An example encountered several times during classification was a deep gully resulting from severe runoff from higher private lands. The gully crosses private and public land alike. This requires expensive and complicated erosion control measures beyond the value of the public lands -- but extending beyond the public lands in ultimate benefits.

Soil Erosion on the Acquired Lands

Of the acquired lands, 62 percent were in Class 1, none to slight erosion, figure 27. This reflects the essentially level topography inasmuch as the LU lands were once homesteaded. Next in extent, 33 percent of the acquired lands were in Class 2 erosion, slight to moderate, with up to three-fourths of the "A" horizon removed by erosion. A small acreage, 5 percent, was in Class 3, moderate to severe. Thus, nearly 40 percent of the acquired lands had soil erosion losses ranging from moderate to severe.

Comparison of Erosion, Public Domain v. Acquired Lands

Only a small part of the acquired lands should have been in cultivation, whereas, roughly one-fourth of their total surface had been plowed. The margins for intensive use were too slim. Damage resulted, not only to the cultivated fields, but to the rangeland. The bad effects are still apparent but are being eased by skilled management.

Past ownership and uses have strong influences on the severity and extent of erosion. Even though soil characteristics and terrain, which determine a land capability have a profound effect on soil erosion, proper use within that land capability is the real defense against soil damage.

We find this illustrated in a similar range condition, but a higher state of soil maintenance, of the isolated tracts of public domain, as compared with those lands once in private management. This cannot be equated solely on the differences in ownership. The topography of the typical isolated tracts, with their land capabilities of predominantly Class VII and VIII soils, introduces a difference in utilization. The public domain by reason of its very roughness and poor production, could not be cultivated in any part; it remained in permanent cover and the soils were protected.

The difference between the two groups lies, therefore, in tacit recognition of the limitations of the land capability of the public domain and its use, accordingly, within that capacity. The acquired lands had greater capabilities but were pushed beyond their limits.

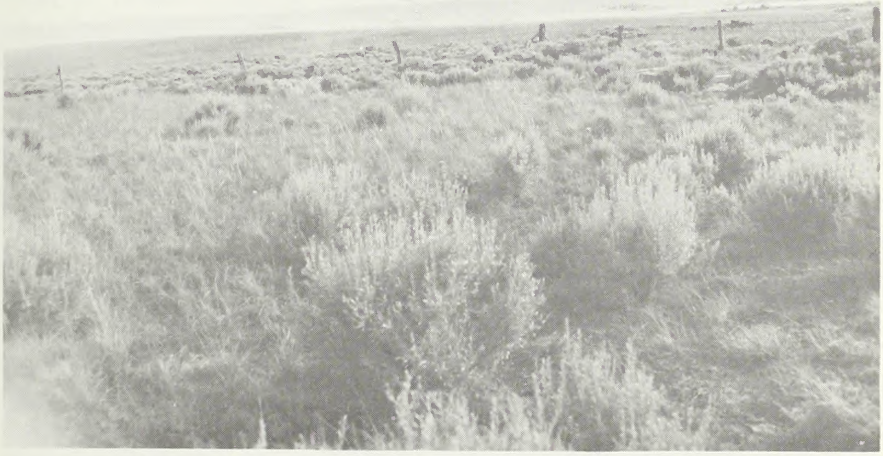


Figure 28: Land capability Class VI. This grazing land in "Excellent" condition requires normal grazing practices for maintenance of soil resources. In the mid-distance is a typical range plant cover, sagebrush. Grassland and sagebrush are the two most common vegetative types.

Land Capabilities and Classes

Land capabilities express the use to which a soil can be put for a long-time safe, economical production. One common classification among government agencies groups land capability determinations into eight broad classes from Class I to VIII. The recommended use of each class is determined by the soil depth, its texture, its fertility, its slope and its erodibility, as they are weighed against long-term production without soil damage. Class I soils are level, deep, fertile and capable of growing any agricultural crop within the limits of the local climate. Classes II, III, and IV are all cultivable, but Class II soils require fewer precautions in farming to protect the soil from erosion, maintain the tilth of the soil, and keep up the level of fertility, than do the soils, for example, of Class IV. Soils of Class IV, in the Upper Yellowstone Area, include those in the dry-land farms where fallow and alternate small-grain strips are used to overcome the limitations of climate.

Classes I to IV lands are usually in cultivation; in the Upper Yellowstone Area they could be either irrigated or dryland. Land capability Class V falls between the two major groups of soils; those suitable for cultivation and those which must always be maintained in permanent cover. Class V lands may be level with deep soils but not cultivable because of recurring hazards such as frequent river overflow, or with rockiness barring the use of farm machinery.

Most of the lands of the Upper Yellowstone Area, and nearly all of the land administered by the Bureau of Land Management, have soils which must be maintained in permanent plant cover. The best of these soils are in Class VI, figure 28, where the level relatively deep and fertile soils require only good range or timber management practices for continued use. Class VII, figure 29, includes those soils with increasing hazards in their use because of steeper topography, shallow soils, soils with unstable textures or concentrations of salts. Rangeland in Class VII is restricted to lighter grazing than on Class VI land.

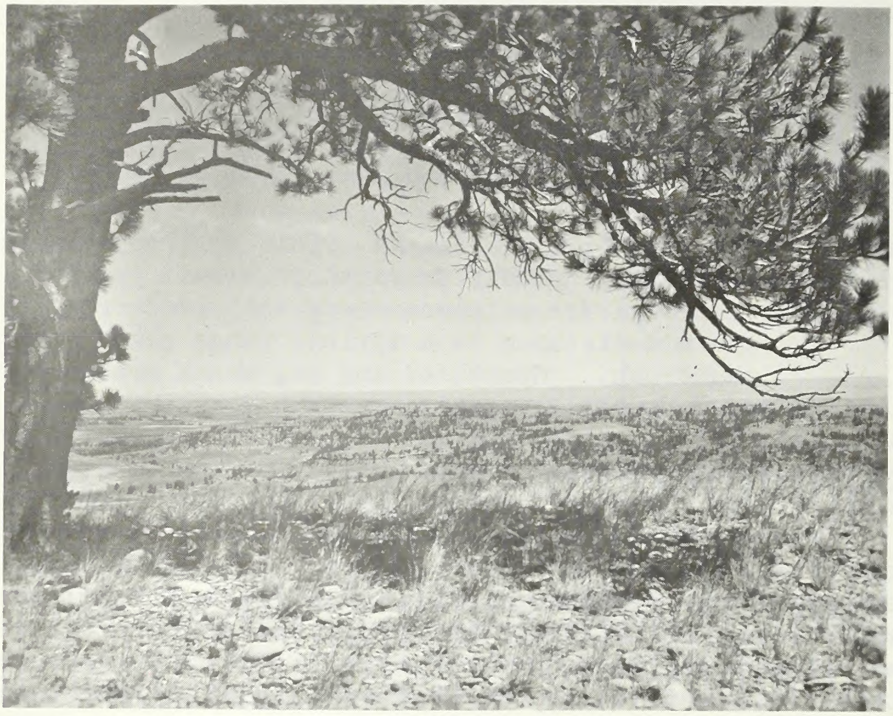


Figure 29: Land capability Class VII is shown throughout the foreground. Steep slopes with danger from soil erosion impose restrictions on grazing use as compared to Class VI (figure 28). This terrain is typical of the shallower soils and pine-covered ridges in the eastern part of the basin.

At the extremes of land capabilities lie the interesting and often desirable Class VII lands. These include marshes, steep rugged mountains and bizarre badlands. Wildlife values are pre-eminent here, as are the closely allied uses of hiking, picnicking, or rock-hounding. Figure 30.

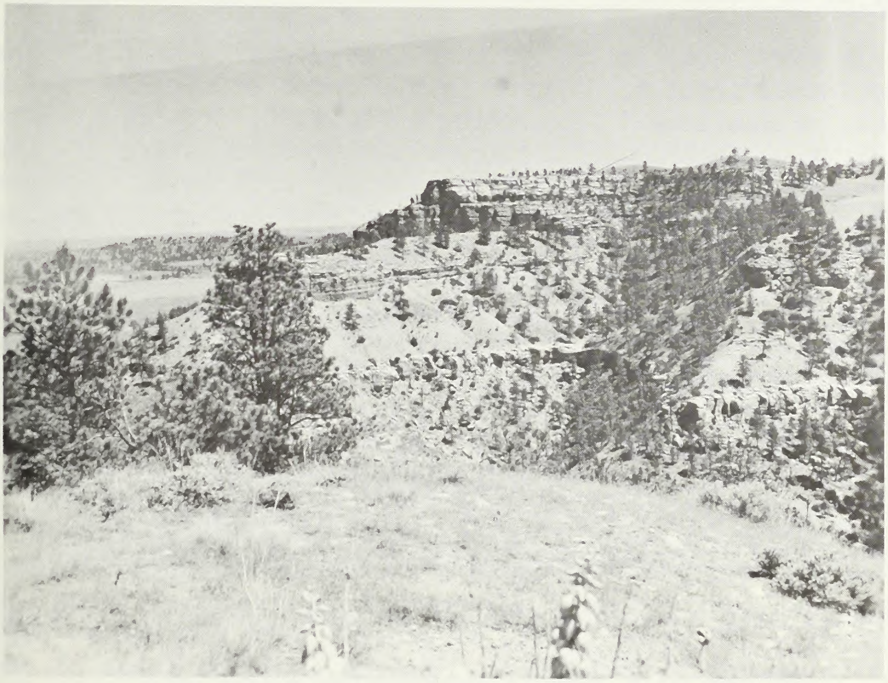


Figure 30: Steep slopes characteristic of many of the tracts of the public domain are seen in the land capability Class VIII of the background. These are often areas of scenic beauty and usually of value to wildlife.

Capabilities of the Public Lands

The largest acreage, 57 percent, of the isolated tracts of the Upper Yellowstone Area, is in land capability Class VII. Class VI lands make up 35 percent of the isolated tracts. Class VIII land is 8 percent of the public domain.

Thus, one-third, roughly, of the isolated tracts (Class VI) are adapted to livestock or timber production without significant restrictions. Less than 1 percent has a capability suited to cropland. Almost two-thirds of the total acreage of the isolated tracts are so rough, mountainous, or rolling, that it either is used by domestic livestock with restrictions in carrying capacity, or in methods of handling, or must be reserved for wildlife. (Classes VII and VIII).

Soils of the acquired lands are preponderantly erosion-resistant and productive; 90 percent are in Class VI, the level and deep-soiled grazing lands; 9 percent are in Class VII, and less than

1 percent are in the wildlands of Class VIII.

Results of River Basin Study Land Classifications

In day-to-day Bureau of Land Management terminology the term "Land Classification" is used in the sense of approval for a change in ownership or management, including suitability for transfer to administration of another public agency. Classification of land within that context is accomplished by an authorized officer of the Bureau of Land Management acting pursuant to authority of one of the public land laws.

In the present study the personnel taking part do not have authority to classify lands in the manner just described, although their work incorporates the basic data found in most formal classification reports. The term "classification", and variations of the word, are thus used in this report within the limitation of classification in a technical sense, as opposed to classification of land in the administrative sense.

In the study of the Upper Yellowstone sub-basin, 526 isolated tracts of vacant public domain aggregating 62,000 acres, were examined and classified. Of those lands, 46 percent were classed as best suited for retention in public ownership. Eleven thousand acres of the lands recommended for retention were found to possess special values for recreation. The remainder of the lands, constituting 54 percent, were recommended for management by individuals. The respective totals for retention in public management programs were 29,000 acres, and for disposition to private management, 33,000 acres.

Retention in Public Ownership

Multiple use values were the paramount reason for retention of 27,000 acres of the lands recommended for continued public administration. Figure 31. A few tracts, totaling over 1,000 acres, were found to have a single use which made them key sites in federal management programs and were thus recommended for retention.

Disposition to Private Ownership

Tracts classed as suitable for disposition to private ownership, and having a single "highest and best" use, totaled 24,000 acres. They were usually so classified because of their isolation and the fact that they did not contribute to grazing management or other federal programs to any unusual degree. Approximately 5,000 acres possessing qualities for multiple use were also recommended for transfer to private ownership, usually because of their isolation within large blocks of private holdings.

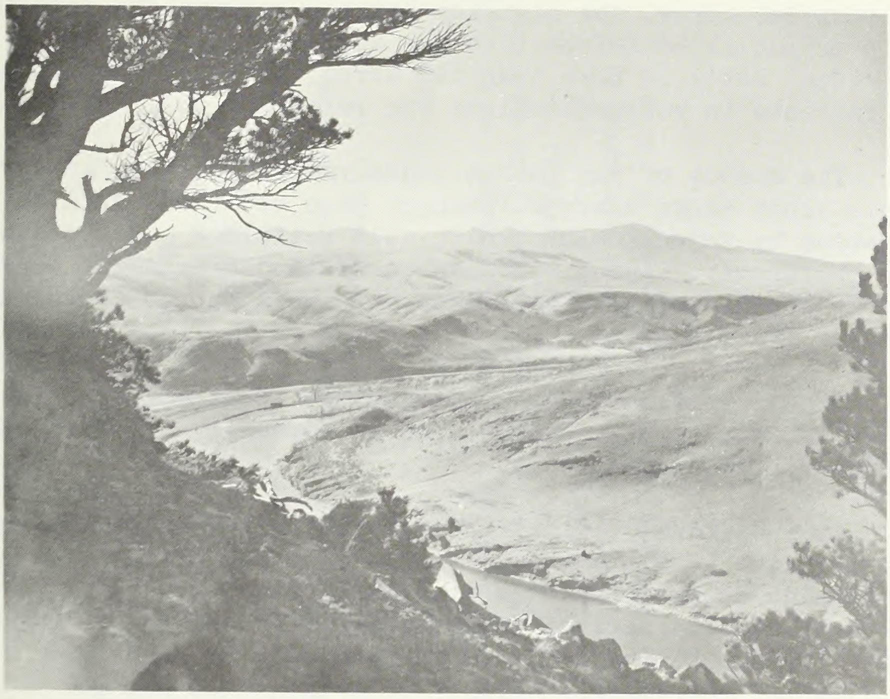


Figure 31: A scenic bend at Buffalo Hump is a good example of multiple use for classification for retention in public management. This site has heavy demand for sport fishing plus potentials for a dam site for power development and other recreational facilities. It is now withdrawn as a recreational site.

Size of Tracts and Types of Disposition

The size of a tract often bears a relationship to the recommended form of disposition. In the Upper Yellowstone sub-basin the most common site of isolated tract was 40 acres or smaller. Of all lands examined, over 80 percent were found to occur in tracts of 160 acres or less.

The 40 acre or smaller tracts were most often recommended for disposal to private management. In that class were about 46 percent of the tracts recommended for private ownership, and 32 percent of those recommended for retention. Classification of smaller acreages for transfer was not axiomatic, however. Many tracts of less than 40 acres were fractional lots lying along the Yellowstone River, and represented potential recreational sites or were essential in providing access to other public lands.

An increase in the size of the tracts was accompanied by increased reasons for retention in public ownership. Among tracts of more than 160 acres, the division between recommended private ownership or public administration was approximately equal. For individual sites of more than 640 acres, however, there was a decided increase in recommendations for retention in public ownership.

The status of the public lands varies from day to day. Since this study began numerous changes have occurred, such as those brought about by rejection of public sale petitions and appeals on rejected petitions. About 4,000 acres of land originally considered as suitable for disposition have been sold pursuant to administrative authority of the agency.

The classification recommendations found appropriate at the time of field inventory are summarized in Appendix "A", each isolated tract being reported separately.

An individual classification form, prepared by the examiner who inspected the land, has been written for each tract. These forms, each containing descriptive elements of its tract in detail, are filed at the Denver headquarters of the Missouri River Basin Field Group, with copies in the District Office at Billings, Montana.

Appendix A -- Description, classification, suitability and proposed management of the public domain, by counties, within the Isolated Tract Classification areas of the Upper Yellowstone River Area, Montana and Wyoming, 1960.

Introduction

The following information, in tabular form, summarizes inventory findings tract by tract. The public domain in the Upper Yellowstone River Area occurs in several patterns. Where this pattern is one of small acreages of public domain scattered through a predominantly private and state ownership, the land was inventoried and classified as a unique entity. The findings for classification and appraisal upon conclusion of the inventory of each unit were forwarded to the appropriate State Land Office.

Of the 60,730 acres in these tables roughly 24,000 acres were recommended to be retained in public ownership. Roughly 36,000 acres were recommended for disposal to private ownership.

Note: The material in the tables is self-explanatory with the exception of the numbers in the columns "Present Land Use" and "Principal Suitability". The numerals which denote this land use and suitability are: 1. Grazing: 2. Cropland: 3. Recreation: 4. Wildlife: 5. Mining: 6. Watershed: 7. Timber: 8. Human Occupancy and Industrial Development: 9. Access and Preservation of Public Values: 10. Submerged. "PSW" identifies a Power Site Withdrawal; "SDW" a Stock Driveway Withdrawal; "Rec" a Recreation Site Withdrawal; and "PWR" a Public Water Withdrawal.

Appendix A -- Description, classification, suitability, and proposed management of the public domain, by counties, within the Isolated Tract classification areas of the Upper Yellowstone River Area, Montana and Wyoming, 1960.

The following footnotes apply throughout Appendix A:
1/ Remnant areas too small to classify.
2/ Identified for recreation site development by State or District Office, all or in part.
3/ Classified by State or District Office.
4/ Disposal consummated or probable at the time of publication.

Carbon County
Montana Principal
Meridian

Twp South	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use	Land Capability Classification	Principal Suitability	Proposed Management
2	22	34	Lot 5	.90	Gently rolling	-	1 -PSW	VI	3-8-9	Public
2	22	35	Lots 6,7,8,& 9	86.78	Gently to steeply rolling	14	1 -PSW	VI	3-8-9	Public
2	23	35	Lot 6	12.40	Probably under water	-	10	VIII	10	Public
3	22	1	W$\frac{1}{2}$SW$\frac{1}{4}$	80.00	Steeply rolling, rocky	15	1	VI	1-3-8	Public
3	22	2	E$\frac{1}{2}$SE$\frac{1}{4}$	80.00	Steeply rolling, rocky	15	1	VI	1-3-8	Public
3	22	3	Lots 2,3,4,& 5;SE$\frac{1}{4}$NW$\frac{1}{4}$	168.91	Gently to steeply rolling	38	1 -PSW	VII	1-3-8-9	Public
3	22	4	Lots 7,8,9,10,& 11; NW$\frac{1}{4}$SE$\frac{1}{4}$	165.52	Gently to steeply rolling	37	1 -PSW	VII	1-3-8-9	Public
3	22	5	Lot 8	15.51	Gently sloping	2	1	VII	1-3	Public
3	22	8	SE$\frac{1}{4}$NE$\frac{1}{4}$;N$\frac{1}{2}$SE$\frac{1}{4}$;SE$\frac{1}{4}$SW$\frac{1}{4}$	160.00	Gently to steeply rolling	43	1	VII	1-3	Public
3	22	9	W$\frac{1}{2}$W$\frac{1}{2}$;NE$\frac{1}{4}$NW$\frac{1}{4}$	200.00	Gently to steeply rolling	38	1	VII	1-3	Public
3	22	9	NE$\frac{1}{4}$NE$\frac{1}{4}$	40.00	Steeply sloping	4	1	VII	1-6	Private
3	22	10	SW$\frac{1}{4}$NE$\frac{1}{4}$	40.00	Gently rolling	6	1	9/V:31/VI	1	Public
3	22	14	NE$\frac{1}{4}$SW$\frac{1}{4}$	40.00	Gently rolling	8	1	VI	1	Public
3	22	35	W$\frac{1}{2}$NW$\frac{1}{4}$	80.00	Rolling, rough, mountainous	16	1	VII	1	Private
3	23	5	Lots 6 & 7	92.10	Steeply rolling, rough	26	1	VI	1-9	Public
3	23	9	NW$\frac{1}{4}$NE$\frac{1}{4}$	40.00	Steep slopes and cuts	4	1	VII	1	Private
3	23	22	S$\frac{1}{2}$NW$\frac{1}{4}$	80.00	Gently rolling	16	1	VI	1	Private
3	23	33	NE$\frac{1}{4}$SW$\frac{1}{4}$	40.00	Gently to steeply rolling	10	1	VI	1	Private
3/ 3	24	18	Lot 5	6.56	Fronting Clarks Fork River	3	1	VI	3	Public
1/ 3	24	19	Lot 2	.14	Island on Clarks Fork River					
3	24	27	NW$\frac{1}{4}$NW$\frac{1}{4}$	40.00	Steeply rolling breaks	6	1	VII	1	Private
3	24	28	NE$\frac{1}{4}$NE$\frac{1}{4}$;S$\frac{1}{2}$NE$\frac{1}{4}$;N$\frac{1}{2}$SE$\frac{1}{4}$; E$\frac{1}{2}$SW$\frac{1}{4}$	280.00	Steeply rolling breaks	30	1	VII	1	Private
3	24	32	SW$\frac{1}{4}$NE$\frac{1}{4}$;N$\frac{1}{2}$SE$\frac{1}{4}$;SW$\frac{1}{4}$SE$\frac{1}{4}$	160.00	Steeply rolling breaks	21	1	VII	1	Private
4	19	35	SE$\frac{1}{4}$NE$\frac{1}{4}$	40.00	Gently rolling	15	1	10/V:30/VI	1-2	Private
4	22	11	NW$\frac{1}{4}$NW$\frac{1}{4}$	40.00	Steeply rolling, mountainous	8	1	VII	1	Private
4/ 4	22	24	NW$\frac{1}{4}$SE$\frac{1}{4}$	40.00	Rolling to mountainous	7	1-2	20/IV:20/VI	1	Private

Appendix A -- Description, classification, suitability, and proposed management of the public domain, by counties, within the Isolated Tract classification areas of the Upper Yellowstone River Area, Montana and Wyoming, 1960.

Carbon County
Montana Principal
Meridian

Twp South	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use	Land Capability Classification	Principal Suitability	Proposed Management
4	23	1	Lot 11	13.72	Level to gently sloping	-	4	VIII	4	Public
4	23	4	Lots 3 & 4	79.21	Gently to steeply rolling	20	1	VI	1	Private
4	23	6	Lot 3	39.87	Steeply rolling	8	1	VI	1	Private
[1] 4	23	12	Lot 2	1.78	On Clarks Fork River					
[1] 4	23	34	Lot 4	2.16	On Clarks Fork River					
[1] 4	23	35	Lot 5	.25	On Clarks Fork River					
4	24	1	Lot 1;SE$\frac{1}{4}$NE$\frac{1}{4}$	80.00	Rough and broken	16	1	VII	1-2	Private
[4] 4	24	5	SE$\frac{1}{4}$	160.00	Gently to steeply rolling	29	1	VII	1-2	Private
[4] 4	24	8	N$\frac{1}{2}$NE$\frac{1}{4}$	80.00	Gently to steeply rolling	14	1	VII	1	Private
[4] 4	24	9	N$\frac{1}{2}$SW$\frac{1}{4}$	480.00	Gently to steeply rolling	77	1	VII	1	Private
4	24	10	SE$\frac{1}{4}$NE$\frac{1}{4}$	40.00	Gently to steeply rolling	8	1	VII	1	Private
4	24	17	E$\frac{1}{2}$E$\frac{1}{2}$;SW$\frac{1}{4}$NE$\frac{1}{4}$	200.00	Gently to steeply rolling	36	1	VII	1	Private
4	24	20	N$\frac{1}{2}$N$\frac{1}{2}$;SW$\frac{1}{4}$NW$\frac{1}{4}$;NW$\frac{1}{4}$SW$\frac{1}{4}$	240.00	Gently to steeply rolling	43	1	VII	1	Private
4	24	21	SW$\frac{1}{4}$NW$\frac{1}{4}$;SW$\frac{1}{4}$	200.00	Gently to steeply rolling	36	1	VII	1	Private
4	24	23	NE$\frac{1}{4}$NW$\frac{1}{4}$	40.00	Rolling deep draws	8	1	VI	1	Private
4	24	26	SE$\frac{1}{4}$SW$\frac{1}{4}$	40.00	Moderately rolling	7	1-2	10/V:30/VI	1-2	Private
4	24	28	SE$\frac{1}{4}$SW$\frac{1}{4}$	40.00	Rolling gentle slopes	8	1	VI	1	Private
4	25	28	Lot 4	25.15	Moderately rolling	4	1	VI	1	Private
4	25	29	Lot 4	30.24	Moderately rolling	5	1	VI	1	Private
4	25	30	NW$\frac{1}{4}$NE$\frac{1}{4}$	40.00	Gently to steeply rolling	10	1	15/V:25/VI	1	Private
4	25	30	SW$\frac{1}{4}$SE$\frac{1}{4}$	40.00	Gently to steeply rolling	10	1	VI	1	Private
5	19	5	SE$\frac{1}{4}$SE$\frac{1}{4}$	40.00	Very steeply rolling	10	1	VI	1	Private
5	19	19	SW$\frac{1}{4}$SE$\frac{1}{4}$	40.00	Gently rolling benchland	13	1	VII	1	Private
[4] 5	22	1	S$\frac{1}{2}$SW$\frac{1}{4}$	80.00	Steeply rolling, rough	16	1	50/VI:30/VII	1	Private
[4] 5	22	11	NE$\frac{1}{4}$NW$\frac{1}{4}$	40.00	Gently to steeply rolling	10	1	VI	1	Private
[4] 5	22	13	NW$\frac{1}{4}$SE$\frac{1}{4}$;NE$\frac{1}{4}$SW$\frac{1}{4}$;W$\frac{1}{2}$SW$\frac{1}{4}$	160.00	Steeply rolling	40	1	90/VI:70/VII	1	Private
[4] 5	22	14	SW$\frac{1}{4}$SE$\frac{1}{4}$	40.00	Steeply rolling, rough	10	1	VI	1	Private
[4] 5	22	15	SE$\frac{1}{4}$SE$\frac{1}{4}$	40.00	Gently to steeply rolling	8	1	VI	1	Private
[4] 5	22	23	NW$\frac{1}{4}$;NW$\frac{1}{4}$NE$\frac{1}{4}$	200.00	Steeply rolling, rough	28	1-4	100/VI:60/VII: 40/VIII	1-4	Private
[4] 5	22	24	E$\frac{1}{2}$NW$\frac{1}{4}$;NE$\frac{1}{4}$SW$\frac{1}{4}$	120.00	Steep, rough, mountainous	20	1	VII	1	Private
[4] 5	22	25	SW$\frac{1}{4}$SW$\frac{1}{4}$	40.00	Rough to steeply rolling	7	1	VI	1	Private
[4] 5	22	26	SE$\frac{1}{4}$;SE$\frac{1}{4}$SW$\frac{1}{4}$	200.00	Rough to steeply rolling	36	1	VI	1	Private

Appendix A -- Description, classification, suitability, and proposed management of the public domain, by counties, within the Isolated Tract classification areas of the Upper Yellowstone River Area, Montana and Wyoming, 1960.

Carbon County
Montana Principal
Meridian

	Twp South	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use	Land Capability Classification	Principal Suitability	Proposed Management
4/	5	22	27	NW$\frac{1}{4}$SE$\frac{1}{4}$;E$\frac{1}{2}$SW$\frac{1}{4}$	120.00	Gently to steeply rolling	17	1-4	70/VI:30/VII: 20/VIII	1-4	Private
4/	5	22	28	SW$\frac{1}{4}$NE$\frac{1}{4}$	40.00	Moderately rolling	8	1	VI	1	Private
4/	5	22	34	NW$\frac{1}{4}$;E$\frac{1}{2}$SW$\frac{1}{4}$;S$\frac{1}{2}$SE$\frac{1}{4}$	320.00	Steeply rolling to rough	45	1-4	190/VI:100/VII: 30/VIII	1-4	Private
4/	5	22	35	N$\frac{1}{2}$NE$\frac{1}{4}$	80.00	Rough to steeply rolling	14	1	VI	1	Private
4/	5	22	35	SW$\frac{1}{4}$SE$\frac{1}{4}$	40.00	Gently to moderately rolling	7	1	VII	1	Private
	5	23	2	SW$\frac{1}{4}$NE$\frac{1}{4}$	40.00	Moderately rolling	3	1	VII	1	Private
	5	23	11	NE$\frac{1}{4}$NW$\frac{1}{4}$;NW$\frac{1}{4}$NE$\frac{1}{4}$	80.00	Moderately rolling	5	1	VII	1	Private
	5	23	18	NE$\frac{1}{4}$NW$\frac{1}{4}$	40.00	Rough, steeply rolling	7	1	VII	1	Private
	5	23	18	SW$\frac{1}{4}$SE$\frac{1}{4}$	40.00	Steeply rolling, mountainous	4	1	VI	1	Private
4/	5	23	19	Lots 3 & 4;E$\frac{1}{2}$W$\frac{1}{2}$	238.72	Steeply rolling, mountainous	37	1	80/VI:158.72/VII	1	Private
	5	23	30	Lot 4;SE$\frac{1}{4}$SW$\frac{1}{4}$	79.58	Gently to steeply rolling	14	1	VI	1	Private
	5	23	31	Lots 1,2,3,& 4;E$\frac{1}{2}$W$\frac{1}{2}$	319.20	Steeply rolling, broken	57	1	VI	1	Private
	5	23	35	SE$\frac{1}{4}$NE$\frac{1}{4}$	40.00	Gently to steeply rolling	6	1	VI	1	Private
2/	5	23	35	SW$\frac{1}{4}$SE$\frac{1}{4}$	40.00	Gently to steeply rolling	8	4-9	VI	4-9	Public
	5	24	5	Lots 5 & 6	84.81	Gently to steeply rolling	15	1	VI	1	Private
	5	24	8	Lots 1,2,3,4,5,6,7,8, 9,10, & 11.	476.36	Gently to steeply rolling	48	1	VI	1	Private
	5	24	10	Lots 1,2,& 3	113.45	Gently to steeply rolling	31	1	VI	1	Private
	5	24	13	Lot 1	42.29	Level to steeply sloping	5	1-2	17.29/VI:25/VII	1-2	Private
	5	24	17	Lot 1	42.46	Gently rolling	7	1	VI	1	Private
	5	24	24	SW$\frac{1}{4}$SE$\frac{1}{4}$	40.00	Gently rolling	8	1	VI	1	Private
	5	24	26	SW$\frac{1}{4}$SE$\frac{1}{4}$	40.00	Steeply rolling, rough	6	1	VI	1	Private
	5	24	27	NW$\frac{1}{4}$NE$\frac{1}{4}$	40.00	Rolling, deep draws	8	1	VI	1	Private
	5	24	28	E$\frac{1}{2}$NE$\frac{1}{4}$;NE$\frac{1}{4}$SE$\frac{1}{4}$	120.00	Rough, steep, mountainous	10	1	VII	1	Private
	5	24	31	Lots 3,4, & 5;SE$\frac{1}{4}$NW$\frac{1}{4}$; E$\frac{1}{2}$SW$\frac{1}{4}$;S$\frac{1}{2}$NE$\frac{1}{4}$;SE$\frac{1}{4}$	479.66	Roughly rolling, steep	48	1-3	VII	1-3	Public
	5	24	32	S$\frac{1}{2}$NW$\frac{1}{4}$;SW$\frac{1}{4}$;SW$\frac{1}{4}$SE$\frac{1}{4}$	280.00	Roughly rolling, steep	28	1-3	VII	1-3	Public
	5	24	34	E$\frac{1}{2}$SW$\frac{1}{4}$;SW$\frac{1}{4}$NE$\frac{1}{4}$	120.00	Steeply rolling, rough	19	1	VI	1	Private
	5	24	35	N$\frac{1}{2}$NE$\frac{1}{4}$;NE$\frac{1}{4}$NW$\frac{1}{4}$;SE$\frac{1}{4}$NE$\frac{1}{4}$; SE$\frac{1}{4}$;NE$\frac{1}{4}$SW$\frac{1}{4}$	360.00	Steeply rolling, rough	51	1	VI	1	Private

Appendix A -- Description, classification, suitability, and proposed management of the public domain, by counties, within the Isolated Tract classification areas of the Upper Yellowstone River Area, Montana and Wyoming, 1960.

Carbon County
Montana Principal
Meridian

Twp South	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use	Land Capability Classification	Principal Suitability	Proposed Management
6	18	32	Lot 8	10.44	Steeply rolling	1	1	VI	1	Private
6	18	32	Lot 12	43.02	Steep and mountainous	-	7	VII	7	Private
2/ 6	23	27	Lot 4	2.72	Fronting Clarks Fork River	-	1	VII	3	Public
6	24	1	Lot 1	31.51	Steeply rolling, broken	4	1	VI	1	Private
2/ 6	24	8	SE¼NE¼	40.00	Fronting Bluewater Creek	4	1	VII	1	Private
6	25	6	Lot 4	32.28	Steeply rolling	5	1	VI	1	Private
6	25	6	Lots 1,8,9,& 16	133.01	Very steeply rolling	11	1	VII	1	Private
7	19	24	S½S½;NW¼SW¼	200.00	Steep, mountainous	14	4-6-7	VII	4-6-7	Public
7	20	19	Lot 4;SE¼SW¼;SW¼SE¼	114.18	Steep, mountainous	6	4-6	VII	4-6	Public
2/ 7	20	29	SW¼SW¼	40.00	Rough, steeply rolling	8	1	VII	1	Private
7	21	18	SE¼NE¼	40.00	Steeply rolling	13	1	VI	1	Private
8	20	8	S½SW¼	80.00	Steep, mountainous	6	3-4	VII	3-4	Public
8	20	9	SE¼NE¼;NE¼SE¼	80.00	Level to steeply rolling	15	1	VI	1	Private
8	20	21	S½NW¼;SW¼NE¼	120.00	Steep and mountainous	10	3-4	VII	3-4	Public

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North	East									
1	8	34	SE¼NE¼	40.00	Rough and mountainous	6	1	VII	1	Private
1	10	12	E½NE¼	80.00	Steeply rolling, mountains	16	1	VI	1	Private
1	10	20	N½NE¼	80.00	Gently sloping sand hills	15	1	VII	1	Private
1	10	24	NW¼NE¼;NE¼NW¼;W½NW¼	160.00	Steeply rolling mountains	24	1	VI	1	Private
1	10	32	SW¼	160.00	Gently sloping sand hills	48	1	VI	1	Private
2	8	8	NW¼NW¼	40.00	Steep, mountainous, rocky	8	1	VI	1	Private
2	8	20	SE¼NW¼	40.00	Steep, mountainous, rocky	8	1	VII	1	Private
2	11	6	Lot 4;SE¼SW¼;SW¼SE¼	104.27	Rough, mountainous, rocky	26	1	VI	1	Private
4	9	6	Lot 3	46.96	Steeply rolling sand hills	5	1	VI	1	Private
5	9	14	Lot 3;E½SW¼	119.54	Steeply sloping, broken	18	1	VII	1	Private
5	9	20	E½	320.00	Rolling rocky ridges	48	1	VII	1	Private
5	9	32	E½W½	160.00	Rolling, rough, rocky ridges	24	1	VII	1	Private

Appendix A -- Description, classification, suitability, and proposed management of the public domain, by counties, within the Isolated Tract classification areas of the Upper Yellowstone River Area, Montana and Wyoming, 1960.

Park County
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	Twp South	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use	Land Capability Classification	Principal Suitability	Proposed Management
	1	9	2	Lots 3 & 4	80.61	Gently to steeply rolling	12	1	VII	1	Private
	1	9	8	NW$\frac{1}{4}$SW$\frac{1}{4}$	40.00	Gently to steeply rolling	8	1	VI	1	Private
	1	9	8	SE$\frac{1}{4}$SE$\frac{1}{4}$	40.00	Gently to steeply rolling	8	1	VI	1	Private
	1	10	18	Lot 4	33.84	Gently to steeply rolling	7	1	VI	1	Private
	1	10	20	SE$\frac{1}{4}$	160.00	Steeply rolling sand hills	32	1	VI	1	Private
	1	10	24	N$\frac{1}{2}$SW$\frac{1}{4}$;Lots 3 & 4	113.72	Steeply rolling sand hills	17	3-8-9	VII	3-8-9	Public
	1	10	30	N$\frac{1}{2}$SE$\frac{1}{4}$;SE$\frac{1}{4}$SE$\frac{1}{4}$	120.00	Steeply rolling sand hills	18	1	VII	1	Private
3/	1	11	28	Lot 6	8.43	Along Yellowstone River	-	3	VII	3	Public
	1	12	20	N$\frac{1}{2}$N$\frac{1}{2}$;SE$\frac{1}{4}$NW$\frac{1}{4}$	200.00	Steep, rolling, broken hills	44	1	VI	1	Private
3/	1	12	28	Lots 1,2,& 3	50.27	Rolling to steeply rolling	12	1-3	VII	1-3	Private
2/	1	12	29	Lots 4 & 5	22.94	Rough, mountainous,along river	9	1-2-3-9 -PSW	VII	1-2-3-9	Public
2/	1	12	32	Lots 1,2,3,4,5,6,& 7; W$\frac{1}{2}$SE$\frac{1}{4}$;SW$\frac{1}{4}$NE$\frac{1}{4}$	272.11	Rough, mountainous,along river	47	1-2-3-9 -PSW	3/III: 269.11/VII	1-2-3-9	Public
2/	1	12	33	W$\frac{1}{2}$NW$\frac{1}{4}$;NW$\frac{1}{4}$SW$\frac{1}{4}$	120.00	Rough, mountainous,along river	27	1-2-3-9 -PSW	VII	1-2-3-9	Public
	2	8	4	E$\frac{1}{2}$SW$\frac{1}{4}$	80.00	Rough and mountainous	15	1-6	VII	1-6	Private
	2	8	4	NW$\frac{1}{4}$NW$\frac{1}{4}$	40.00	Rough and mountainous	7	1-6	VII	1-6	Private
	2	8	6	Lots 1,2,3,4,5,7,10, & 11	284.58	Rough and mountainous	33	1-6	VII	1-6	Private
	2	8	34	SE$\frac{1}{4}$	160.00	Steep and mountainous	26	1-6	70/VII:90/VIII	1-6	Private
	2	9	4	Lots 3,4;S$\frac{1}{2}$NW$\frac{1}{4}$	160.20	Steeply rolling, rocky	24	1	VII	1	Private
	2	9	24	SE$\frac{1}{4}$SE$\frac{1}{4}$	40.00	Level to gently sloping	6	1	VI	1	Private
	2	9	34	W$\frac{1}{2}$SE$\frac{1}{4}$	80.00	Steeply rolling, rocky	15	1 -PSW	VI	1	Private
1/	2	9	35	Lot 5	.30	Island, Yellowstone River					
1/	2	9	36	Lot 1	.46	Island, Yellowstone River					
	2	10	2	SW$\frac{1}{4}$NW$\frac{1}{4}$;W$\frac{1}{2}$SW$\frac{1}{4}$	120.00	Very gently sloping	28	1	VI	1	Private
	2	10	3	SE$\frac{1}{4}$;SW$\frac{1}{4}$NE$\frac{1}{4}$	200.00	Gently to steeply sloping	46	1	VI	1	Private
	2	10	10	NE$\frac{1}{4}$;NE$\frac{1}{4}$NW$\frac{1}{4}$	200.00	Gently rolling, rocky	46	1	VI	1	Private
	2	10	17	E$\frac{1}{2}$NE$\frac{1}{4}$;S$\frac{1}{2}$;S$\frac{1}{2}$S$\frac{1}{2}$NW$\frac{1}{4}$; S$\frac{1}{2}$SW$\frac{1}{4}$NE$\frac{1}{4}$	460.00	Gently rolling, sloping	69	1	VII	1	Private
	2	10	20	N$\frac{1}{2}$N$\frac{1}{2}$	160.00	Gently sloping	24	1	VII	1	Private

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Montana Principal
Meridian

	Twp South	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use	Land Capability Classification	Principal Suitability	Proposed Management
	2	11	10	NE¼SW¼	40.00	Gently to steeply rolling	8	1	VI	1	Private
	2	11	14	W½SE¼	80.00	Gently to steeply rolling	12	1	VII	1	Private
	2	11	21	SW¼SW¼	40.00	Gently to steeply rolling	6	1	VII	1	Private
2/	2	12	5	Lots 5, & 6	23.65	Along Yellowstone River	-	1	VI	3	Public
3/	2	12	6	Lot 1	7.27	Steep river bank on Yellowstone River	-	1	VII	3	Public
	2	12	18	SE¼SE¼	40.00	Steeply rolling, rough	6	1	VII	1	Private
	2	12	27	NE¼NE¼	40.00	Steeply rolling, rough	6	1	VI	1	Private
	2	25	18	Lot 12	40.00	Rolling to steeply rolling	8	1	VI	1	Private
	2	25	35	NE¼SE¼	40.00	Rolling	10	1	VI	1	Private
	2	26	20	NW¼SW¼	40.00	Gently to steeply rolling	8	1	VI	1	Private
	3	8	20	SW¼SW¼	40.00	Steeply rolling, rocky	8	1	VII	1	Private
	3	8	22	W½	320.00	Steep, mountainous, rocky	80	6-7	60/VI:170/VII: 90/VIII	6-7	Private
	3	9	2	Lot 2;SW¼;SW¼NW¼	240.00	Mountainous	29	6 -PSW	VII	3-4-6-7	Public
	3	9	10	All	640.00	Rough, mountainous, rocky	-	1-6 -PSW	VII	1-6	Public
	3	9	12	E½	320.00	Rough, mountainous, rocky	-	3-9 -PSW	VIII	3-9	Public
2/	3	9	14	Lot 5	29.48	Rough, mountainous, rocky	-	3-9 -PSW	VIII	3-9	Public
	3	9	30	Lots 3, & 4;E½SW¼	155.60	Steep, rough, mountainous	28	1	VII	1	Private
	3	10	8	SW¼NW¼	40.00	Rough and mountainous	7	1-4-6-7	VII	1-4-6-7	Private
	3	10	8	SE¼SW¼	40.00	Rough and mountainous	6	1-4-6-7	VII	1-4-6-7	Private
	3	10	17	NW¼NE¼	40.00	Rough and mountainous	5	1-4-6-7	VII	1-4-6-7	Private
2/	3	10	17	S½NW¼;NE¼SW¼	120.00	Along Suce Creek	-	3-6	VII	3	Public
2/	3	10	18	SE¼NE¼	40.00	Along Suce Creek	-	3-6	VII	3	Public
	3	10	20	NE¼;SE¼NW¼;E½SW¼; W½SE¼	360.00	Rough and mountainous	54	1-4-6-7	VII	1-4-6-7	Private
	3	11	13	SW¼NW¼	40.00	Steep, hilly	11	1	VI	1	Private
2/	3	12	9	W½NW¼	80.00	Both sides of Boulder Creek	-	3	VII	3	Public
	4	18	4	NE¼NE¼;S½NE¼;SE¼	280.00	Very steeply rolling	53	1-4-6	170/VII:110/VIII	1-4-6	Private
	4	18	26	S½NW¼;N½SW¼	160.00	Very steeply rolling	32	1	VI	1	Private
3/	4	9	2	Lot 3	18.77	Frontage, Yellowstone River	-	1	VI	3	Public
1/	4	9	10	Lot 9	.29	Island, Yellowstone River					
	4	9	20	W½SE¼;SE¼SE¼	120.00	Level to gently rolling	20	1 -PSW	VII	1	Public

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Meridian

Twp South	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use	Land Capability Classification	Principal Suitability	Proposed Management
4	9	30	Lots 3 & 4;E$\frac{1}{2}$SW$\frac{1}{4}$	158.84	Level to gently rolling	26	1 -PSW	3.84/V:155/VII	1	Public
3/ 4	9	32	NW$\frac{1}{4}$SW$\frac{1}{4}$	40.00	Steeply rolling	4	1 -PSW	VII	1-4-6	Public
2/ 5	8	27	NE$\frac{1}{4}$NW$\frac{1}{4}$	40.00	Level to rolling	4	1	VI	3	Public
5	9	14	Lots 1,2,3,5,6,7,8, & 9;SW$\frac{1}{4}$NE$\frac{1}{4}$;SE$\frac{1}{4}$NW$\frac{1}{4}$	404.75	Rough, steep, mountainous	-	3-4-6-7	VIII	3-4-6-7	Public
5	9	26	Lots 3 & 4;SW$\frac{1}{4}$;W$\frac{1}{2}$SE$\frac{1}{4}$	326.50	Rough, steep, mountainous	32	1	VII	1	Private
5	9	32	W$\frac{1}{2}$NW$\frac{1}{4}$	80.00	Steeply rolling, rough	20	1	VI	1	Private
6	8	14	Lot 4;E$\frac{1}{2}$SW$\frac{1}{4}$	126.15	Steep, mountainous, rocky	20	1-6	46.15/VI:80/VII	1-6	Private
6	8	22	Lots 5 & 8;NE$\frac{1}{4}$SW$\frac{1}{4}$; SW$\frac{1}{4}$NW$\frac{1}{4}$;SE$\frac{1}{4}$NW$\frac{1}{4}$	202.98	Steep, mountainous, rocky	31	1-6 -SDW	102.98/VI: 100/VII	1-6	Private
6	8	27	Lots 1,2,3,& 4;E$\frac{1}{2}$NW$\frac{1}{4}$; NE$\frac{1}{4}$SW$\frac{1}{4}$	288.56	Steep, mountainous, rocky	43	1-6	VII	1-6	Private
6	8	28	Lots 1,2,3,4,5,6,7, & 8	342.23	Steep, mountainous, rocky	51	1-6	VII	1-6	Private
6	8	32	Lots 6,7,8,9,10,13, 14,& 15	207.85	Steep, bald, mountains	27	1-6	VII	1-6	Private
6	8	32	Lots 5,11,& 12	115.41	Steep, bald, mountains	11	1-6 -SDW	VII	1-6	Private
6	8	33	Lots 1,2,3,4,& 5; SE$\frac{1}{4}$NW$\frac{1}{4}$;S$\frac{1}{2}$NE$\frac{1}{4}$	309.05	Steep, bald, mountains	46	1-6	VII	1-6	Private
6	9	2	Lots 1,2,3,& 4;S$\frac{1}{2}$N$\frac{1}{2}$; NE$\frac{1}{4}$SE$\frac{1}{4}$;S$\frac{1}{2}$SE$\frac{1}{4}$;SW$\frac{1}{4}$SW$\frac{1}{4}$	489.96	Rugged mountains	-	3-4-6-8	VIII	3-4-6-8	Public
6	9	6	S$\frac{1}{2}$SE$\frac{1}{4}$	80.00	Rugged, rocky, mountains	-	3-6-7	VIII	3-6-7	Public
7	7	2	Lot 4	53.45	Steeply rolling	10	1	VII	1	Private
7	7	10	E$\frac{1}{2}$E$\frac{1}{2}$	160.00	Steeply rolling, rocky, hills	34	1-6 -SDW	VII	1-6	Public
7	7	14	W$\frac{1}{2}$W$\frac{1}{2}$	160.00	Steeply rolling, rocky, hills	32	1-6 -SDW	VII	1-6	Public
2/ 7	7	20	Lot 4	28.43	Fronting Yellowstone River	3	1	VII	3	Public
7	7	20	Lots 5,7,& 8;E$\frac{1}{2}$SW$\frac{1}{4}$	133.71	Steeply rolling, rough	-	1-3-9-PSW	VII	1-3-9	Public
7	7	22	E$\frac{1}{2}$E$\frac{1}{2}$	160.00	Steeply rolling, rocky, hills	32	1-6 -SDW	VII	1-6	Public
7	8	5	Lot 4;SW$\frac{1}{4}$NW$\frac{1}{4}$;W$\frac{1}{2}$SW$\frac{1}{4}$	172.75	Very steep rocky slope	32	1-6 -SDW	VII	1-6	Private
7	8	8	W$\frac{1}{2}$W$\frac{1}{2}$	160.00	Very steep rocky slope	32	1-6 -SDW	VII	1-6	Private
8	6	10	SW$\frac{1}{4}$SE$\frac{1}{4}$	40.00	Steep, rocky, mountainous	8	1	VII	1	Private
8	6	18	NE$\frac{1}{4}$NE$\frac{1}{4}$	40.00	Steep, rocky, mountainous	10	1	VII	1	Private
8	6	18	Lot 1;NE$\frac{1}{4}$NW$\frac{1}{4}$	75.42	Steep, rocky, mountainous	11	1	VII	1	Private

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Sweetgrass County
Montana Principal
Meridian

	Twp North	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use	Land Capability Classification	Principal Suitability	Proposed Management
	1	12	20	N½NW¼;SE¼NW¼	120.00	Steeply rolling, rocky, hills	24	1	40/VI:80/VII	1	Private
	1	12	22	S½SW¼	80.00	Steeply rolling, rocky, hills	10	1-4-6	50/VI:30/VII	1-4-6	Private
	1	12	26	SE¼NW¼;N½SE¼;SE¼SE¼	160.00	Steeply rolling, rough, hills	27	1-4-6	VII	1-4-6	Private
	1	12	30	NE¼NE¼	40.00	Gently to steeply rolling	10	1	20/VI:20/VII	8	Private
	1	12	30	SE¼SE¼	40.00	Steeply rolling, rough, rocky	11	1	VII	8	Private
	1	12	30	Lots 3 & 4	79.24	Steeply rolling, rough, rocky	18	1	VII	8	Private
	1	12	32	SW¼SW¼	40.00	Gently to steeply rolling	11	1	20/VI:20/VII	8	Private
	1	12	32	N½NE¼	80.00	Gently to steeply rolling	20	1	60/VI:20/VII	8	Private
4/	1	13	2	Lot 1;SW¼NW¼	80.04	Gently to steeply rolling	21	1	20/III:30.04/VI:30/VII	1-2	Private
4/	1	13	4	SE¼SE¼;SE¼NW¼	80.00	Steeply rolling, rough, rocky	13	1	VII	1	Private
4/	1	13	8	SE¼NE¼	40.00	Steeply rolling, rough, rocky	11	1	VII	1	Private
4/	1	13	10	NE¼;E½NW¼;NW¼NW¼	280.00	Gently sloping to rough, steep	57	1	75/III:205/VII	1	Private
3/	1	13	24	Lots 1 & 2	70.83	Rolling, fronts Yellowstone River	18	1 -PSW	VI	3	Public
3/	1	13	25	Lot 5	7.86	Level, fronting Yellowstone River	2	1 -PSW	VI	3	Public
2/	1	13	35	Lots 4 & 5	45.24	Fronting Yellowstone River	9	1 -PSW	V	3	Public
	1	13	35	Lot 3	38.69	Gently rolling to undulating	12	1 -PSW	VI	1-9	Public
	1 1	13 14	24,25 19,20,30	Unsurveyed island	140.00	Level island	42	1-9 -PSW	VI	1-3-9	Public
	1	14	6	Lots 1 & 2	81.28	Rough, rocky, and hilly	10	1	20/III:61.28/VII	1	Private
	1	14	6	Lot 7	37.68	Gently to steeply rolling	9	1	15/VI:22.68/VII	1-2	Private
3/	1	14	12	Lot 13	6.63	Island on Yellowstone River	-	4	V	3	Public
3/	1	15	17	Lot 1	8.66	Fronts Yellowstone River	-	4	VI	3	Public
	1	15	17	Lot 3	12.69	Gently rolling, rocky	6	3-8	VI	3-8	Public
3/	1	15	21	Lot 4	.56	Island on Yellowstone River	-	1-4	V	3	Public
3/	1	15	22	Lot 5	5.80	Island on Yellowstone River	2	1-4	V	3	Public
	1	15	33	SE¼SE¼	40.00	Gently to steeply rolling	10	1-3	VI	1-3	Public
	1	16	2	Lots 1,2,3,& 4	194.00	Steeply rolling, rough, rocky	32	1	124/VI:70/VII	3-4	Public
	1	16	2	S½S½	160.00	Steeply rolling, rough, rocky	27	1	90/VI:70/VII	3-4-7	Public
	1	16	10	Lot 1;NE¼NW¼;N½NE¼;SE¼NE¼	197.90	Steeply rolling, rough, rocky	28	3-4-6	117.90/VI:80/VII	3-4-6	Public
	1	16	10	SE¼SW¼;S½SE¼	120.00	Steeply rolling, rough, rocky	31	3-4-6	70/VI:50/VII	3-4-6	Public
	1	16	12	NW¼;N½SW¼	240.00	Gently to steeply rolling	36	3-4-6	130/VI:110/VII	3-4-6	Public
	1	16	12	Lots 3,& 4	76.21	Gently to steeply rolling	13	3-4-6	VII	3-4-6	Public

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Sweetgrass County
Montana Principal
Meridian

	Twp North	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use	Land Capability Classification	Principal Suitability	Proposed Management
	1	16	14	N½NW¼	80.00	Gently to steeply rolling	17	3-4-6	VII	3-4-6	Public
	2	12	24	Lot 1	44.94	Steeply rolling	10	1	VII	1	Private
	2	12	34	Lot 1	37.93	Steeply rolling, rocky	8	1	VII	8	Private
	2	13	20	NE¼NW¼;NW¼NE¼;SE¼NE¼	120.00	Steeply rolling, rough, rocky	28	1	VII	1	Private
	2	13	34	SW¼SW¼	40.00	Gently to steeply rolling	10	1	25/VI:15/VII	1	Private
	2	14	22	E½SE¼	80.00	Steeply rolling, rough, rocky	12	1	20/VI:60/VII	1	Private
	2	15	18	Lot 1;NE¼NW¼	79.38	Steep to rolling hills	17	1	20/VI:59.38/VII	1	Private
4/	2	15	18	SE¼SE¼	40.00	Gently sloping, rocky	9	1	VII	1	Private
4/	2	15	20	NW¼NW¼	40.00	Gently rolling, rocky	7	1	VII	1	Private
4/	2	15	28	All	640.00	Steeply rolling, rough, rocky	114	3-4-8	200/VI:440/VII	3-4-8	Private
	2	16	4	SW¼SW¼	40.00	Gently to steeply rolling	8	1-3-4	VII	1-3-4	Private
	2	16	6	Lot 1	55.27	Steeply rolling, rough, rocky	10	1	25.27/VI:30/VII	1	Private
	2	16	6	Lots 4 & 5	45.48	Steeply rolling, rough, rocky	7	1	20/VI:25.48/VII	1	Private
	2	16	8	SW¼	160.00	Steeply rolling, rough, rocky	27	1	80/VI:80/VII	1	Private
	2	16	14	S½SE¼	80.00	Steeply rolling, mountainous	8	1	10/VI:70/VII	1	Private
	2	16	26	S½N½;S½	480.00	Steeply rolling, mountainous	88	3-4-7	260/VI:220/VII	3-4-7	Public
	2	16	34	N½	320.00	Steeply rolling, mountainous	62	3-4-7	130/VI:190/VII	3-4-7	Public
	2	17	22	NE¼NE¼	40.00	Gently to steeply rolling	6	3-4	15/VI:25/VII	3-4	Public
	2	17	22	N½NW¼;SW¼NW¼	120.00	Steeply rolling, rocky	22	3-4	30/VI:90/VII	3-4	Public
	2	17	22	SE¼;SE¼SW¼	200.00	Steeply rolling, rough, rocky	30	3-4	25/VI:135/VII: 40/VIII	3-4	Public
	2	17	24	NW¼NE¼	40.00	Gently to steeply rolling	6	3-4	15/VI:25/VII	3-4	Public
	2	17	30	Lots 3 & 4;NE¼SW¼	77.70	Steeply rolling, rough, rocky	12	3-4	27.70/VI:50/VII	3-4	Public
4/	3	13	6	Lot 2	40.50	Undulating foothills	3	1	VII	1	Private
4/	3	13	28	SE¼SW¼	40.00	Steep, undulating, foothills	8	1-6	10/VI:30/VII	1	Private
4/	3	13	28	E½SE¼	80.00	Steeply rolling foothills	18	1-6	25/VI:55/VII	1	Private
4/	3	13	34	E½NE¼;N½SE¼	160.00	Steeply rolling, mountainous	45	1	20/VI:140/VII	1	Private
	3	14	4	SW¼SW¼	40.00	Steeply rolling rough	9	1	15/VI:25/VII	1	Private
	3	14	8	E½E½	160.00	Rocky, rough, mountainous	19	1	80/VI:80/VII	1	Private
	3	14	20	N½NW¼;SW¼NW¼	120.00	Rough, rocky, mountainous	25	1	VII	8	Private
	3	14	20	Lot 5	40.15	Steeply rolling, rocky	9	1	20/VI:20/VII	8	Private
	3	15	2	SE¼;E½SW¼	240.00	Mostly in Lake Adams	4	3-10	20/VII:220/VIII	3-10	Public
	3	15	14	W½NE¼;E½NW¼;NE¼SW¼; SW¼SW¼	240.00	All in Lake Wolvoord	-	3-10	VIII	3-10	Public

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Sweetgrass County
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Meridian

Twp North	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use	Land Capability Classification	Principal Suitability	Proposed Management
3	16	20	N½NE¼	80.00	Gently to steeply rolling	16	1	20/VI:60/VII	1	Private
3	16	22	NE¼SE¼	40.00	Steeply rolling, rough, rocky	8	1-3-4	15/VI:25/VII	1-3-4	Private
3	16	30	Lots 1,2, & 3	136.27	Steep, rocky, mountainous	32	1	25/VI:111.27/VII	1	Private
3	16	30	SE¼SE¼	40.00	Gently to steeply rolling	10	1	VI	1	Private
3	18	28	NW¼;W½NE¼;NE¼NE¼	280.00	Steeply rolling, rocky, hills	39	1	65/VI:215/VII	1	Private
4	13	32	SW¼NW¼	40.00	Gently rolling hills	13	1	25/VI:15/VII	1	Private
4	14	20	NW¼NW¼	40.00	Gently to steeply rolling	11	1-2	20/VI:20/VII	1-2	Private
4	14	20	NE¼NE¼	40.00	Gently rolling, rocky	10	1-2	25/VI:15/VII	1-2-8	Private
4	14	20	S½SE¼	80.00	Gently to steeply rolling	24	1-2	VI	1-2-8	Private
4	14	34	NW¼NW¼;NE¼NW¼	80.00	Gently rolling shale hills	26	1	VII	1	Private
4	14	34	S½SW¼	80.00	Sharply rolling shale hills	24	1	VII	1	Private
4	15	12	N½N½	160.00	Steeply rolling shale hills	29	1	VII	1	Private
4	16	28	S½	320.00	Steeply rolling, rocky, hills	58	1	130/VI:190/VII	1	Private
4	16	32	W½NW¼	80.00	Steeply rolling, hilly	14	1	45/VI:35/VII	1	Private
5	12	26	NW¼NW¼	40.00	Steeply rolling, rocky, hills	13	1	VI	1	Private
5	12	26	NE¼NE¼	40.00	Steeply rolling, rocky, hills	11	1	VI	1	Private
5	13	18	Lot 2	39.31	Steeply rolling, rocky, hills	14	1	VI	1-3-4	Private
5	13	18	Lot 4;SE¼SW¼	79.27	Steeply rolling, rocky, hills	24	1	VI	1-3-4	Private
5	13	30	Lot 1	41.96	Gently rolling, rocky, hills	13	1	VI	1-3-4	Private
5	13	32	NE¼NW¼	40.00	Gently sloping, rocky	14	1	VI	1-2	Private
5	13	32	SE¼SW¼	40.00	Gently sloping, rocky	14	1	VI	1-2	Private
South	East									
1	12	24	NE¼NW¼;S½NW¼;N½SW¼; SW¼SW¼	240.00	Steeply rolling, rough, hills	24	1-3-5	70/VI:170/VII	1-3-5	Public
1	13	8	Lot 5	10.03	Level	4	3-9	VI	3-9	Public
1	13	18	SE¼SW¼	40.00	Gently to steeply rolling	7	1-3-9	25/VI:15/VII	1-3-9	Private
1	13	18	Lot 1	3.19	Undulating to rolling	-	3-9	VII	3-9	Public
1	14	3	Lot 8	7.01	Level to undulating	2	3	VII	3	Public
1	14	6	SE¼NW¼	40.00	Gently to steeply rolling	11	1	10/VI:30/VII	1	Private
1	14	6	Lot 7;SE¼SW¼	73.74	Gently to steeply rolling	25	1	36/III:37.74/VII	1	Private
1	14	8	W½NW¼	80.00	Steeply rolling, rough, rocky	15	1-2	47/III:20/VI:13/VII	1-2-5	Public

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	Twp South	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use	Land Capability Classification	Principal Suitability	Proposed Management
	1	14	12	NE$\frac{1}{4}$SW$\frac{1}{4}$	40.00	Sloping to gently rolling	15	1	20/VI:20/VII	1-2	Private
	1	14	18	Lots 3,& 4;SE$\frac{1}{4}$SW$\frac{1}{4}$	109.45	Gently sloping to rolling	21	1	20/IV:89.45/VII	1	Private
	1	14	23	SW$\frac{1}{4}$NE$\frac{1}{4}$	40.00	Gently sloping to rolling	15	1	VI	1	Private
	1	14	26	NW$\frac{1}{4}$NE$\frac{1}{4}$	40.00	Gently rolling, rocky	15	1	VI	1	Private
	1	15	1	S$\frac{1}{2}$SE$\frac{1}{4}$NW$\frac{1}{4}$	20.00	Rough broken hills	3	1	VII	1	Private
	1	15	2	SE$\frac{1}{4}$NE$\frac{1}{4}$;N$\frac{1}{2}$SE$\frac{1}{4}$	120.00	Steep broken rocky hills	22	1	70/VI:50/VII	1	Private
	1	15	6	Lot 7;NE$\frac{1}{4}$SW$\frac{1}{4}$	72.43	Gently rolling, rocky hills	26	1	10/III:25/VI: 37.43/VII	1-2	Private
	1	15	9	SE$\frac{1}{4}$SW$\frac{1}{4}$;SW$\frac{1}{4}$SE$\frac{1}{4}$	80.00	Gently rolling to sloping	28	1	30/VI:50/VII	1-2	Private
	1	15	18	Lot 1;NE$\frac{1}{4}$NW$\frac{1}{4}$	73.42	Steeply rolling, rocky hills	28	1	VII	1	Private
	1	15	18	Lot 3	33.52	Undulating to gently sloping	14	1	VI	1	Private
	1	15	18	SE$\frac{1}{4}$NE$\frac{1}{4}$	40.00	Gently to steeply rolling	12	1	30/VI:10/VII	1	Private
	1	15	21	NE$\frac{1}{4}$SW$\frac{1}{4}$	40.00	Rough broken hills	6	1	10/VI:30/VII	1-3	Public
	1	15	23	E$\frac{1}{2}$SW$\frac{1}{4}$	80.00	Steeply rolling, rocky hills	20	1	30/VI:50/VII	1	Private
	1	15	27	S$\frac{1}{2}$SE$\frac{1}{4}$	80.00	Steeply rolling, rocky hills	13	1	10/VI:70/VII	1	Private
	1	15	28	SW$\frac{1}{4}$NE$\frac{1}{4}$;E$\frac{1}{2}$NW$\frac{1}{4}$	120.00	Steeply rolling, rocky hills	19	1	50/VI:70/VII	3	Public
	1	15	33	S$\frac{1}{2}$SW$\frac{1}{4}$	80.00	Rough, broken, rocky, and hilly	14	1	15/VI:65/VII	1-3	Public
	1	15	34	SE$\frac{1}{4}$NW$\frac{1}{4}$;SW$\frac{1}{4}$NE$\frac{1}{4}$;W$\frac{1}{2}$SE$\frac{1}{4}$; N$\frac{1}{2}$NE$\frac{1}{4}$	160.00	Steeply rolling, rocky	26	1	50/VI:110/VII	1	Private
	1	15	35	N$\frac{1}{2}$NE$\frac{1}{4}$	80.00	Steeply rolling, rocky	18	1	VII	1	Private
	1	15	35	SE$\frac{1}{4}$NW$\frac{1}{4}$;N$\frac{1}{2}$SW$\frac{1}{4}$;SW$\frac{1}{4}$SW$\frac{1}{4}$	160.00	Steep, rough, rocky, hills	26	1	VII	1	Private
	1	16	4	SE$\frac{1}{4}$NE$\frac{1}{4}$;NE$\frac{1}{4}$SE$\frac{1}{4}$	80.00	Rough and mountainous	21	1	15/VI:65/VII	1	Private
1/	1	16	6	Lot 1	1.09	On Yellowstone River					
	1	16	12	Lots 9,10,11,& 12	159.56	Steeply mountainous, rocky	25	1	65/VI:94.56/VII	1	Private
	1	16	18	NE$\frac{1}{4}$NW$\frac{1}{4}$;NW$\frac{1}{4}$NE$\frac{1}{4}$	80.00	Steeply rolling, rocky	17	1-8	55/VI:25/VII	1-8	Public
	1	16	29	NW$\frac{1}{4}$;E$\frac{1}{2}$SW$\frac{1}{4}$;NW$\frac{1}{4}$SE$\frac{1}{4}$	280.00	Hilly, with steep rimrocks	56	1-6	140/VI:140/VII	1-6	Private
	1	16	32	SW$\frac{1}{4}$;S$\frac{1}{2}$SE$\frac{1}{4}$	240.00	Steep, rocky, and rough hills	53	1-6	90/VI:150/VII	1-6	Private
	1	16	33	W$\frac{1}{2}$SE$\frac{1}{4}$;E$\frac{1}{2}$SW$\frac{1}{4}$;SW$\frac{1}{4}$SW$\frac{1}{4}$	200.00	Steeply rolling,rocky hills	44	1-6	85/VI:115/VII	1-6	Private
	1	17	4	E$\frac{1}{2}$E$\frac{1}{2}$;SW$\frac{1}{4}$SE$\frac{1}{4}$	201.45	Steeply rolling, mountainous	36	1	VII	1	Private
	1	17	4	Lots 3,& 4;SW$\frac{1}{4}$NW$\frac{1}{4}$	120.23	Steeply rolling, rocky	17	1	55/VI:65.23/VII	1	Private
1/	1	17	26	Lot 7	.57	Along the Yellowstone River					
3/	1	17	26	Lot 3	13.63	Gently sloping	-	1	VI	3	Public
	1	17	29	SW$\frac{1}{4}$SE$\frac{1}{4}$	40.00	Steeply rolling, rocky	10	1	VII	3	Public
	1	17	31	Lot 1	34.31	Gently to steeply rolling	8	1	14.31/VI:20/VII	3	Public

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Twp South	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use	Land Capability Classification	Principal Suitability	Proposed Management
2	13	14	NW$\frac{1}{4}$NE$\frac{1}{4}$	40.00	Gently to steeply rolling	7	1-3	VII	1-3-8	Public
2	13	21	SW$\frac{1}{4}$NW$\frac{1}{4}$	40.00	Steeply rolling, rocky	8	1	VII	1	Private
2	13	29	Lots 5,6,7,& 8	131.65	Steeply mountainous	50	3	65/VI:66.65/VII	3	Public
2	13	31	Lots 3,4,5,6,7,8,9, & 10	320.56	Steeply mountainous	118	3	115/VI:205.56/VII	3	Public
2	13	32	NW$\frac{1}{4}$;NW$\frac{1}{4}$NE$\frac{1}{4}$;NW$\frac{1}{4}$SE$\frac{1}{4}$	240.00	Steeply rolling, mountainous	57	1	90/VI:150/VII	3-8	Public
2	13	34	NE$\frac{1}{4}$NW$\frac{1}{4}$	40.00	Steeply rolling foothills	10	1-8	VII	1-8	Public
2	13	34	NW$\frac{1}{4}$SE$\frac{1}{4}$	40.00	Steeply rolling foothills	10	1-8	VII	1-8	Public
2	14	10	Lots 3 & 4;S$\frac{1}{2}$NW$\frac{1}{4}$;SW$\frac{1}{4}$	344.92	Gently to steeply rolling	128	7	VII	7	Public
2	15	1	Lots 1,2, & 3	162.95	Foothills to mountainous	33	1	VII	1	Private
2	15	2	Lot 4	53.81	Steeply rolling foothills	13	1	30/VI:23.81/VII	1	Private
2	15	2	NW$\frac{1}{4}$SE$\frac{1}{4}$	40.00	Steeply rolling foothills	10	1	10/VI:30/VII	1	Private
2	15	3	Lot 1	53.86	Steeply rolling foothills	10	1	15/VI:38.86/VII	1	Private
2	15	3	SE$\frac{1}{4}$SW$\frac{1}{4}$	40.00	Steeply rolling foothills	8	1	VII	1	Private
2	15	4	SE$\frac{1}{4}$SE$\frac{1}{4}$	40.00	Steeply rolling foothills	4	1	VII	1	Private
3/ 2	15	5	Lot 4	53.81	Steeply rolling	18	1	VII	1	Private
2	15	11	NW$\frac{1}{4}$NW$\frac{1}{4}$	40.00	Steeply rolling foothills	10	1	10/VI:30/VII	1	Private
2	15	13	NE$\frac{1}{4}$SE$\frac{1}{4}$	40.00	Steeply rolling foothills	10	1	15/VI:25/VII	1	Private
2	15	22	SE$\frac{1}{4}$NE$\frac{1}{4}$;E$\frac{1}{2}$SE$\frac{1}{4}$;W$\frac{1}{2}$E$\frac{1}{2}$; E$\frac{1}{2}$W$\frac{1}{2}$;SW$\frac{1}{4}$SW$\frac{1}{4}$	480.00	Rough, steep , mountainous	25	1	VII	1-3-7	Public
2	16	4	Lots 1 & 2;S$\frac{1}{2}$NE$\frac{1}{4}$; NW$\frac{1}{4}$SE$\frac{1}{4}$	194.10	Steeply rolling, rocky	45	1-6	85/VI:109.10/VII	1-6	Private
2	16	4	Lot 4	36.57	Steeply rolling. rocky	8	1-6	VII	1-6	Private
2	16	4	SE$\frac{1}{4}$SW$\frac{1}{4}$	40.00	Very steeply rolling, rocky	9	1-6	10/VI:30/VII	1-6	Private
2	16	5	Lots 1 & 8	77.09	Rough, broken, and rocky	18	1-6	25/VI:52.09/VII	1-7	Private
2	16	7	S$\frac{1}{2}$NE$\frac{1}{4}$	80.00	Steeply rolling foothills	12	6	25/VI:55/VII	6	Private
2	16	8	S$\frac{1}{2}$NW$\frac{1}{4}$;SW$\frac{1}{4}$NE$\frac{1}{4}$	120.00	Steeply rolling foothills	18	6	55/VII:65/VIII	6	Private
2	16	9	NW$\frac{1}{4}$SE$\frac{1}{4}$	40.00	Steep, rocky, foothills	3	6	25/VII:15/VIII	6	Private
2	16	10	NW$\frac{1}{4}$NW$\frac{1}{4}$	40.00	Steeply rocky, foothills	3	6	30/VII:10/VIII	6	Private
2	16	12	SE$\frac{1}{4}$SW$\frac{1}{4}$	40.00	Gently to steeply rolling	10	6	25/VI:15/VII	6	Private
2	16	17	N$\frac{1}{2}$SW$\frac{1}{4}$	80.00	Steep, rocky, foothills	8	6	25/VI:55/VII	6	Private
2	16	18	NW$\frac{1}{4}$SE$\frac{1}{4}$	40.00	Steep, rocky, foothills	4	7	20/VII:20/VIII	7	Private
2	16	20	NE$\frac{1}{4}$SE$\frac{1}{4}$	40.00	Steep, rocky, foothills	3	7	VII	7	Private

Appendix A -- Description, classification, suitability, and proposed management of the public domain, by counties, within the Isolated Tract classification areas of the Upper Yellowstone River Area, Montana and Wyoming, 1960.

Sweetgrass County
Montana Principal
Meridian

Twp South	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use	Land Capability Classification	Principal Suitability	Proposed Management
2	16	21	SW¼NE¼;N½SE¼;SE¼SW¼; SW¼SE¼	200.00	Steeply rolling, mountainous	35	7	60/VI:115/VII: 25/VIII	7	Private
2	16	28	S½SE¼	80.00	Steeply rolling, mountainous	9	3-6	35/VI:45/VII	3-6	Public
2	16	31	Lot 4	36.57	Hilly, rocky, rough	4	3-6	VII	3-6	Public
2	16	31	SE¼SE¼	40.00	Steeply rolling, rocky	3	3-6	VII	3-6	Public
2	16	32	S½SW¼	80.00	Steeply rolling, rocky	9	3-6	VII	3-6	Public
2	16	33	SW¼NE¼	40.00	Steeply rolling, mountainous	5	3-6	15/VI:25/VII	3-6	Public
2	16	33	NE¼SE¼	40.00	Steeply rolling, mountainous	5	3-6	15/VI:25/VII	3-6	Public
2	17	10	SW¼SW¼	40.00	Steeply rolling to rough	6	3-6	10/VI:30/VII	3-6	Public
2	17	24	SW¼SW¼	40.00	Gently to steeply rolling	9	1-4	VI	1-4	Private
2	17	28	SW¼NW¼	40.00	Steeply rolling, rough, rocky	6	1-3-4-6	10/VI:30/VII	1-3-4-6	Public
2	17	30	Lot 2	36.55	Steeply rolling, rough, rocky	7	1-3-4-6	VII	1-3-4-6	Public
3	12	14	N½NE¼;SW¼NE¼	120.00	Steeply rolling, mountainous	10	3-8 -PSW	15/III:20/VI: 85/VII	3-8	Public
3	12	24	E½W½;E½	480.00	Mountainous, timbered	25	3-7-8	VII	3-7-8	Public
3	12	24	NW¼SW¼;W½NW¼	120.00	Rolling	12	3-7-8-9 -PSW	VI	3-7-8-9	Public
3	13	1	SE¼;S½NE¼;SE¼NW¼: E½SW¼	360.00	Steep, rough, mountainous	24	4	45/VI:315/VII	4	Public
3	13	13	SE¼NE¼;E½SE¼;SW¼SE¼; SE¼SW¼	200.00	Steep, rough, mountainous	20	4	50/VI:150/VII	4	Public
3	13	19	Lots 3,4,5,6,7,8,9, & 10	307.92	Steep, rocky, mountainous	26	1-6-7-8	70/VI:237.92/VII	1-6-7-8	Public
3	13	20	Lots 12 & 13	80.02	Steep, rocky, mountainous	10	1-6-7-8	20/VI:60.02/VII	1-6-7-8	Public
3	13	24	NW¼NE¼	40.00	Steep, rocky, mountainous	3	4	10/VI:30/VII	4	Public
3	16	5	SW¼SW¼	40.00	Steeply rolling, rocky, rough	3	1-6-7-SDW	30/VII:10/VIII	1-6-7	Public
3	16	6	Lot 5	36.35	Steeply rolling, mountainous	3	1-6-7	20/VII:16.35/VIII	1-6-7	Public
3	16	7	Lot 1	36.60	Steeply rolling, rough, rocky	3	1-6-7	30/VII:6.60/VIII	1-6-7	Public
3	16	7	Lots 3 & 4;NE¼SW¼; W½NE¼;NW¼SE¼	233.14	Rough, mountainous, timbered	19	1-6-7	15/VI:85/VII: 133.14/VIII	1-6-7	Public
3	16	7	E½E½;SW¼SE¼;SE¼SW¼	240.00	Rough, mountainous, timbered	19	1-6-7-SDW	20/VI:95/VII 125/VIII	1-6-7	Public
3	16	8	NW¼NW¼	40.00	Steeply rolling foothills	3	1-6-7-SDW	30/VII:10/VIII	1-6-7	Public

Appendix A -- Description, classification, suitability, and proposed management of the public domain, by counties, within the Isolated Tract classification areas of the Upper Yellowstone River Area, Montana and Wyoming, 1960

Sweetgrass County
Montana Principal
Meridian

Twp South	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use	Land Capability Classification	Principal Suitability	Proposed Management
3	16	18	Lot 1;N½NE¼	116.56	Mountainous, rough, timbered	9	1-6-7	90/VII:26.56/VIII	1-6-7	Public
3	16	18	Lot 2;E½NW¼	116.58	Rough, mountainous, timbered	9	1-6-7-SDW	25/VI:75/VII: 16.58/VIII	1-6-7	Public

Stillwater County
Montana Principal
Meridian

	North	East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use	Land Capability Classification	Principal Suitability	Proposed Management
4/	1	19	20	SE¼SE¼	40.00	Gently to steeply rolling	8	1	VI	1	Private
4/	1	22	6	Lots 1,2,& 3;S½NE¼; SE¼NW¼;E½SW¼;SE¼	479.81	Level to gently sloping	72	1	VI	1	Private
4/	2	18	12	SE¼	160.00	Gently to steeply rolling	34	1	VI	1	Private
4/	2	19	6	Lots 5,6,& 7;SE¼NW¼ S½NE¼;E½SW¼;SE¼	476.61	Gently to steeply rolling	124	1	VI	1	Private
4/	2	19	8	NW¼SE¼	40.00	Gently to steeply rolling	8	1	VI	1	Private
	2	22	30	Lots 3 & 4;E½SW¼	156.35	Level to gently sloping	16	1	VI	1	Private
4/	3	20	6	Lots 1,2, & 3	86.49	Gently to steeply rolling	22	1	VI	1	Private
	3	20	12	SE¼	160.00	Gently rolling	32	1-3-4	VI	1-3-4	Public
4/	3	20	34	NW¼SW¼	40.00	Gently sloping	--	3-4	VII	3-4	Public
4/	3	21	6	Lots 10,11,12, & 13	17.33	Level to gently sloping	5	1	V	1	Private
	3	21	18	Lots 1,2,3, & 4	152.44	Gently rolling	31	1-3-4	VI	1-3-4	Public
4/	3	21	34	SW¼SW¼	40.00	Level to gently rolling	4	1	VI	1	Private
3/	4	19	2	SE¼SW¼	40.00	Gently rolling to rough	3	1	30/VI: 10/VII	1	Private
3/	4	19	6	Lots 4 & 5	60.64	Moderately to steeply rolling	10	1	VI	1	Private
3/	4	19	8	NW¼NW¼	40.00	Moderately rolling to steep	6	1	30/VI:10/VII	1	Private
3/	4	21	2	Lot 4	10.85	Moderately rolling to rough	2	1	8/VI:2.85/VII	1	Private
3/	4	21	10	E½NE¼;SW¼NE¼;NW¼SE¼	160.00	Moderately rolling to rough	15	1-4-6	80/VI:80/VII	1	Private
3/	4	21	20	NE¼NE¼	40.00	Moderately rolling to rough	4	1-6	20/VI:20/VII	1	Private

Appendix A -- Description, classification, suitability, and proposed management of the public domain, by counties, within the Isolated Tract classification areas of the Upper Yellowstone River Area, Montana and Wyoming, 1960

Stillwater County
Montana Principal
Meridian

	Twp South	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use	Land Capability Classification	Principal Suitability	Proposed Management
	1	18	24	NW$\frac{1}{4}$;NW$\frac{1}{4}$NE$\frac{1}{4}$;NW$\frac{1}{4}$SE$\frac{1}{4}$; SW$\frac{1}{4}$SW$\frac{1}{4}$	280.00	Steeply rolling,rough	56	1	VI	1	Private
	1	18	26	NW$\frac{1}{4}$NW$\frac{1}{4}$;SE$\frac{1}{4}$	200.00	Gently to steeply rolling	41	1	VI	1	Private
	1	18	34	Lot 1	49.17	Steeply rolling,ledges, cliff	10	1-3-9	VI	1-3-9	Public
	1	19	32	N$\frac{1}{2}$NE$\frac{1}{4}$	80.00	Steeply rolling, sharp coulees	20	1	VI	1	Private
	1	20	22	N$\frac{1}{2}$NW$\frac{1}{4}$;W$\frac{1}{2}$SW$\frac{1}{4}$	160.00	Steeply rolling, rough	32	1	VI	1	Private
4/	1	23	32	N$\frac{1}{2}$NE$\frac{1}{4}$;NW$\frac{1}{4}$;W$\frac{1}{2}$SW$\frac{1}{4}$	320.00	Rough breaks, broken	35	1-7	VII	1-7	Private
	2	18	9	SE$\frac{1}{4}$SE$\frac{1}{4}$	40.00	Steeply rolling sandhills	8	1	VI	1	Private
	2	18	10	NE$\frac{1}{4}$SW$\frac{1}{4}$	40.00	Steeply rolling sandhills	8	1	VI	1	Private
1/	2	19	6	Lot 12	.70	Along the Yellowstone River					
	2	19	8	SE$\frac{1}{4}$NE$\frac{1}{4}$;N$\frac{1}{2}$SW$\frac{1}{4}$	120.00	Gently to steeply rolling	24	1	VI	1	Private
1/	2	19	14	Lot 1	.13	Along the Yellowstone River					
	2	20	10	SE$\frac{1}{4}$SE$\frac{1}{4}$	40.00	Steeply rolling, broken	6	1	VI	1	Private
1/	2	20	19	Lot 7	.61	Along the Yellowstone River					
3/	2	20	20	Lot 5	5.90	Island in the Yellowstone River	--	-	VI	3	Public
	2	20	29	Lot 9;SE$\frac{1}{4}$SE$\frac{1}{4}$	75.34	Level	--	2 -PSW	III	2	Private
2/	2	20	31	SE$\frac{1}{4}$NE$\frac{1}{4}$	40.00	Steeply rolling, rough	--	3-9	VIII	3-9	Public
2/	2	20	31	Lots 3 & 6	65.96	Steep, mountainous	--	3-9 -PSW	VIII	3-9	Public
2/	2	20	32	Lots 2,3	66.07	Steep, mountainous, rough	--	3-9 -PSW	VIII	3-9	Public
3/	2	23	20	N$\frac{1}{2}$NE$\frac{1}{4}$	80.00	Rolling, with cliffs	8	1	VII	1	Private
	2	23	34	Lot 3	15.07	Island on Yellowstone River	-	1	VII	3-4	Public
	3	17	27	SW$\frac{1}{4}$SW$\frac{1}{4}$	40.00	Steeply rolling to rough	8	1	VII	1	Private
	3	18	7	NE$\frac{1}{4}$NE$\frac{1}{4}$	40.00	Partly old lake bed	5	1 -SDW	VI	1	Private
	3	18	7	NE$\frac{1}{4}$SE$\frac{1}{4}$	40.00	Level to gently sloping	12	1	VI	1	Private
3/	3	19	12	Lot 1	23.26	Fronting Stillwater River	--	1	VI	3	Public
2/	3	19	14	Lot 8	10.05	Fronting Stillwater River	--	3	VII	3	Public
2/	3	19	22	Lots 2 & 3;NE$\frac{1}{4}$NW$\frac{1}{4}$	79.14	Steep sand rock bluffs	12	3-9 -PSW	35/VI:44.14/VII	3-9	Public
3/	3	19	23	NE$\frac{1}{4}$SW$\frac{1}{4}$;NW$\frac{1}{4}$SE$\frac{1}{4}$;SW$\frac{1}{4}$SE$\frac{1}{4}$	120.00	Steeply rolling to rough	10	1	VII	1	Private
	3	20	6	Lot 3	40.29	Steeply rolling to rough	2	3	VII	3	Public
2/	3	20	6	Lots 11 & 12	46.57	Steeply rolling to rough	6	3-9	VII	3-9	Public
2/	3	21	6	Lot 1	25.00	Fronting Yellowstone River	--	3	VI	3	Public
	3	21	7	NE$\frac{1}{4}$SE$\frac{1}{4}$	40.00	Gently to steeply rolling	7	1	VI	1	Private
2/	3	21	8	Lot 1	9.07	Fronting Yellowstone River	--	3	VI	3	Public

Appendix A -- Description, classification, suitability, and proposed management of the public domain, by counties, within the Isolated Tract classification areas of the Upper Yellowstone River Area, Montana and Wyoming, 1960.

Stillwater County
Montana Principal
Meridian

	Twp South	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use	Land Capability Classification	Principal Suitability	Proposed Management
2/	3	21	9	Lots 6 & 7	26.19	Scenic, adjacent to Yellowstone River.	14	3	VI	3	Public
2/	3	21	9	Lots 5 & 9	54.07	Island in the river	--	3	VI	3	Public
2/	4	15	27	NE¼SW¼	40.00	Scenic, adjacent to Stillwater River.	--	3	VI	3	Public
	4	15	31	SE¼SE¼	40.00	Steeply sloping	16	1	VI	1	Private
	4	16	2	SW¼NW¼;NE¼SW¼;NW¼SE¼	120.00	Steeply rolling, rough	12	4-6-7	35/VI:45/VII: 40/VIII	4-6-7	Public
	4	16	4	SE¼SW¼	40.00	Gently to steeply sloping	13	1-4	VI	1-4	Public
	4	16	5	SW¼SW¼	40.00	Steeply rolling	10	1-3-4-6 -SDW	VI	1-3-4-6	Public
	4	16	6	Lot 7;SE¼SW¼;S½SE¼	156.56	Gently to steeply sloping	48	1-3-4-6 -SDW	VI	1-3-4-6	Public
	4	16	7	NE¼NW¼	40.00	Gently rolling	10	1-3-4-6	VI	1-3-4-6	Public
	4	16	8	N½N½	160.00	Rough and mountainous	43	1-3-4-6 -SDW	90/VI:70/VII	1-3-4-6	Public
	4	16	9	E½SE¼;NW¼SE¼	120.00	Rough and mountainous	23	1-4	VII	1-4	Public
	4	16	9	N½NE¼	80.00	Rough and mountainous	16	1-4	VI	1-4	Public
	4	16	9	NW¼NW¼;E½NW¼;S½SE¼	200.00	Rough and mountainous	51	1-4 -SDW	130/VI:70/VII	1-4	Public
	4	16	10	NW¼NW¼;E½SW¼;SW¼SE¼	160.00	Rough, steeply rolling	45	1-3-4-6	50/VI:110/VII	1-3-4-6	Public
	4	16	10	SW¼NW¼;W½SW¼	120.00	Rough, steeply rolling	22	1-3-4-6 -SDW	115/VII:5/VIII	1-3-4-6	Public
	4	16	13	SE¼SE¼;S½NW¼;SW¼NE¼	160.00	Steeply rolling, rough	35	1-3-4-6 -SDW	80/VI:40/VII: 40/VIII	1-3-4-6	Public
	4	16	14	N½NW¼;SE¼NW¼	120.00	Rough and steeply rolling	37	1-3-4-6 -SDW	60/VI:40/VII: 20/VIII	1-3-4-6	Public
2/	4	16	22	SE¼NW¼;NE¼SW¼	80.00	Along the Stillwater River	8	1	VII	3	Public
2/	4	17	4	SW¼NE¼;SE¼NW¼;NE¼SW¼ NW¼SE¼	160.00	Along the Stillwater River	10	1	80/VI:80/VII	3	Public
	4	17	35	SE¼SW¼	40.00	Rolling, steeply rolling	8	1	VII	1	Private
2/	5	16	4	SW¼SW¼	40.00	Steep rough	4	7	5/VII:35/VII	3	Public
	5	17	4	Lot 2	40.12	Very steeply rolling	8	1	VII	1	Private

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Stillwater County
Montana Principal
Meridian

Twp South	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use	Land Capability Classification	Principal Suitability	Proposed Management
5	17	5	$S\frac{1}{2}NW\frac{1}{4}$	80.00	Moderately rolling	14	1	VI	1	Private
5	17	6	$NE\frac{1}{4}SW\frac{1}{4}$	40.00	Moderately rolling	10	1	VI	1	Private
5	18	7	$SW\frac{1}{4}NE\frac{1}{4};SE\frac{1}{4}SW\frac{1}{4}$	80.00	Gently rolling	16	1	40/VI:40/VII	1	Private
6	17	5	Lot 4;$S\frac{1}{2}NW\frac{1}{4};E\frac{1}{2}SW\frac{1}{4}$	199.69	Gently to steeply rolling	28	4-6-7	VII	4-6-7	Public
6	17	8	Lots 4,5,6, & 7	162.82	Steep, rough, mountainous	--	3-4-6-7	VII	3-4-6-7	Public
6	17	15	$SW\frac{1}{4}NW\frac{1}{4};E\frac{1}{2}NW\frac{1}{4};NW\frac{1}{4}NE\frac{1}{4}$	160.00	Steeply rolling, mountainous	20	3-4-6-7	VII	3-4-6-7	Public
6	17	17	All	640.00	Steep, rough, mountainous	--	3-4-6-7	VII	3-4-6-7	Public
6	17	21	$W\frac{1}{2}W\frac{1}{2}$	160.00	Steep, rough, mountainous	--	3-4-6-7	VII	3-4-6-7	Public

Yellowstone County
Montana Principal
Meridian

North	East									
1	27	8	Lots 3,4, & 6	58.84	Gently sloping river bottom	4	3-9	VI	3-9	Public
2	26	14	$N\frac{1}{2}NW\frac{1}{4}$	80.00	Gently sloping to rolling	22	1	VI	1	Private
3	25	20	$N\frac{1}{2}N\frac{1}{2}$	160.00	Steeply rolling, rough, broken	20	1-3-4	110/VII:50/VIII	1-3-4	Public
3	25	22	$W\frac{1}{2}SE\frac{1}{4}$	80.00	Steeply rolling broken	12	1-3-4	60/VII:20/VIII	1-3-4	Public
3	26	32	$S\frac{1}{2}SE\frac{1}{4}$	80.00	Steeply rolling choppy	15	1	VII	1	Private
3	27	24	$S\frac{1}{2}SE\frac{1}{4}$	80.00	Choppy sand hills	12	1	30/VI:30/VII: 20/VIII	1	Private
3	28	2	$E\frac{1}{2}E\frac{1}{2};NE\frac{1}{4}NW\frac{1}{4};NW\frac{1}{4}NE\frac{1}{4};SW\frac{1}{4}SE\frac{1}{4};SE\frac{1}{4}SW\frac{1}{4}$	320.00	Choppy sand hills	42	3-4	140/VI:120/VII: 60/VIII	3-4	Public
3	28	4	$NE\frac{1}{4}NE\frac{1}{4};NW\frac{1}{4}NW\frac{1}{4}$	80.00	Choppy sand hills	10	3-4	20/VI:50/VII: 10/VIII	3-4	Public
3	28	10	$N\frac{1}{2}$	320.00	Choppy sand hills	38	3-4	90/VI:190/VII: 40/VIII	3-4	Public
3	28	14	$SW\frac{1}{4}SW\frac{1}{4}$	40.00	Choppy sand hills	6	3-4	VII	3-4	Public
3	28	18	$NE\frac{1}{4}NE\frac{1}{4}$	40.00	Choppy sand hills	5	1	VII	1	Private
3	28	18	Lots 9 and 10	46.70	Choppy sand hills	5	1	VII	1	Private
3	28	24	Lot 5	40.21	Steeply rolling cliffs	4	3	25/VI:10/VII: 5.21/VIII	1-3	Public

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Stillwater County
Montana Principal
Meridian

	Twp South	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use	Land Capability Classification	Principal Suitability	Proposed Management
2/	3	21	9	Lots 6 & 7	26.19	Scenic, adjacent to Yellowstone River.	14	3	VI	3	Public
2/	3	21	9	Lots 5 & 9	54.07	Island in the river	--	3	VI	3	Public
2/	4	15	27	NE¼SW¼	40.00	Scenic, adjacent to Stillwater River.	--	3	VI	3	Public
	4	15	31	SE¼SE¼	40.00	Steeply sloping	16	1	VI	1	Private
	4	16	2	SW¼NW¼;NE¼SW¼;NW¼SE¼	120.00	Steeply rolling, rough	12	4-6-7	35/VI:45/VII: 40/VIII	4-6-7	Public
	4	16	4	SE¼SW¼	40.00	Gently to steeply sloping	13	1-4	VI	1-4	Public
	4	16	5	SW¼SW¼	40.00	Steeply rolling	10	1-3-4-6 -SDW	VI	1-3-4-6	Public
	4	16	6	Lot 7;SE¼SW¼;S½SE¼	156.56	Gently to steeply sloping	48	1-3-4-6 -SDW	VI	1-3-4-6	Public
	4	16	7	NE¼NW¼	40.00	Gently rolling	10	1-3-4-6	VI	1-3-4-6	Public
	4	16	8	N½N½	160.00	Rough and mountainous	43	1-3-4-6 -SDW	90/VI:70/VII	1-3-4-6	Public
	4	16	9	E½SE¼;NW¼SE¼	120.00	Rough and mountainous	23	1-4	VII	1-4	Public
	4	16	9	N½NE¼	80.00	Rough and mountainous	16	1-4	VI	1-4	Public
	4	16	9	NW¼NW¼;E½NW¼;S½SE¼	200.00	Rough and mountainous	51	1-4 -SDW	130/VI:70/VII	1-4	Public
	4	16	10	NW¼NW¼;E½SW¼;SW¼SE¼	160.00	Rough, steeply rolling	45	1-3-4-6	50/VI:110/VII	1-3-4-6	Public
	4	16	10	SW¼NW¼;W½SW¼	120.00	Rough, steeply rolling	22	1-3-4-6 -SDW	115/VII:5/VIII	1-3-4-6	Public
	4	16	13	SE¼SE¼;S½NW¼;SW¼NE¼	160.00	Steeply rolling, rough	35	1-3-4-6 -SDW	80/VI:40/VII: 40/VIII	1-3-4-6	Public
	4	16	14	N½NW¼;SE¼NW¼	120.00	Rough and steeply rolling	37	1-3-4-6 -SDW	60/VI:40/VII: 20/VIII	1-3-4-6	Public
2/	4	16	22	SE¼NW¼;NE¼SW¼	80.00	Along the Stillwater River	8	1	VII	3	Public
2/	4	17	4	SW¼NE¼;SE¼NW¼;NE¼SW¼ NW¼SE¼	160.00	Along the Stillwater River	10	1	80/VI:80/VII	3	Public
	4	17	35	SE¼SW¼	40.00	Rolling, steeply rolling	8	1	VII	1	Private
2/	5	16	4	SW¼SW¼	40.00	Steep rough	4	7	5/VII:35/VII	3	Public
	5	17	4	Lot 2	40.12	Very steeply rolling	8	1	VII	1	Private

Appendix A -- Description, classification, suitability, and proposed management of the public domain, by counties, within the Isolated Tract classification areas of the Upper Yellowstone River Area, Montana and Wyoming, 1960

Stillwater County
Montana Principal
Meridian

Twp South	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use	Land Capability Classification	Principal Suitability	Proposed Management
5	17	5	$S\frac{1}{2}NW\frac{1}{4}$	80.00	Moderately rolling	14	1	VI	1	Private
5	17	6	$NE\frac{1}{4}SW\frac{1}{4}$	40.00	Moderately rolling	10	1	VI	1	Private
5	18	7	$SW\frac{1}{4}NE\frac{1}{4};SE\frac{1}{4}SW\frac{1}{4}$	80.00	Gently rolling	16	1	40/VI:40/VII	1	Private
6	17	5	Lot 4;$S\frac{1}{2}NW\frac{1}{4};E\frac{1}{2}SW\frac{1}{4}$	199.69	Gently to steeply rolling	28	4-6-7	VII	4-6-7	Public
6	17	8	Lots 4,5,6, & 7	162.82	Steep, rough, mountainous	--	3-4-6-7	VII	3-4-6-7	Public
6	17	15	$SW\frac{1}{4}NW\frac{1}{4};E\frac{1}{2}NW\frac{1}{4};NW\frac{1}{4}NE\frac{1}{4}$	160.00	Steeply rolling, mountainous	20	3-4-6-7	VII	3-4-6-7	Public
6	17	17	All	640.00	Steep, rough, mountainous	--	3-4-6-7	VII	3-4-6-7	Public
6	17	21	$W\frac{1}{2}W\frac{1}{2}$	160.00	Steep, rough, mountainous	--	3-4-6-7	VII	3-4-6-7	Public

Yellowstone County
Montana Principal
Meridian

North	East									
1	27	8	Lots 3,4, & 6	58.84	Gently sloping river bottom	4	3-9	VI	3-9	Public
2	26	14	$N\frac{1}{2}NW\frac{1}{4}$	80.00	Gently sloping tó rolling	22	1	VI	1	Private
3	25	20	$N\frac{1}{2}N\frac{1}{2}$	160.00	Steeply rolling, rough, broken	20	1-3-4	110/VII:50/VIII	1-3-4	Public
3	25	22	$W\frac{1}{2}SE\frac{1}{4}$	80.00	Steeply rolling broken	12	1-3-4	60/VII:20/VIII	1-3-4	Public
3	26	32	$S\frac{1}{2}SE\frac{1}{4}$	80.00	Steeply rolling choppy	15	1	VII	1	Private
3	27	24	$S\frac{1}{2}SE\frac{1}{4}$	80.00	Choppy sand hills	12	1	30/VI:30/VII: 20/VIII	1	Private
3	28	2	$E\frac{1}{2}E\frac{1}{2};NE\frac{1}{4}NW\frac{1}{4};NW\frac{1}{4}NE\frac{1}{4};$ $SW\frac{1}{4}SE\frac{1}{4};SE\frac{1}{4}SW\frac{1}{4}$	320.00	Choppy sand hills	42	3-4	140/VI:120/VII: 60/VIII	3-4	Public
3	28	4	$NE\frac{1}{4}NE\frac{1}{4};NW\frac{1}{4}NW\frac{1}{4}$	80.00	Choppy sand hills	10	3-4	20/VI:50/VII: 10/VIII	3-4	Public
3	28	10	$N\frac{1}{2}$	320.00	Choppy sand hills	38	3-4	90/VI:190/VII: 40/VIII	3-4	Public
3	28	14	$SW\frac{1}{4}SW\frac{1}{4}$	40.00	Choppy sand hills	6	3-4	VII	3-4	Public
3	28	18	$NE\frac{1}{4}NE\frac{1}{4}$	40.00	Choppy sand hills	5	1	VII	1	Private
3	28	18	Lots 9 and 10	46.70	Choppy sand hills	5	1	VII	1	Private
3	28	24	Lot 5	40.21	Steeply rolling cliffs	4	3	25/VI:10/VII: 5.21/VIII	1-3	Public

Appendix A -- Description, classification, suitability, and proposed management of the public domain, by counties, within the Isolated Tract classification areas of the Upper Yellowstone River Area, Montana and Wyoming, 1960

Yellowstone County
Montana Principal
Meridian

	Twp North	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use	Land Capability Classification	Principal Suitability	Proposed Management
1/	3	28	26	Lot 5	1.51	Along the Yellowstone River					
3/	3	28	28	Lot 6	8.37	Moderately rolling to rough	--	4	VII	1	Private
	3	29	2	SE$\frac{1}{4}$SE$\frac{1}{4}$	40.00	Gently to steeply rolling	5	1	25/VI:15/VII	1	Private
1/	3	29	20	Lot 5	3.44	Along the Yellowstone River					
2/	3	29	22	Lots 5,6,7, & 8	68.72	Adjoins the Yellowstone River	10	4	VI	3	Public
1/	3	29	24	Lot 6	.18	Along the Yellowstone River					
2/	3	29	24	Lot 5	4.27	Adjoins the Yellowstone River	--	4	VI	3	Public
	3	30	22	Lots 5,6,7, & 8	56.95	Choppy broken sand hills	5	3-9	30/VI:26.95/VII	3-9	Public
	4	25	12	E$\frac{1}{2}$	320.00	Steeply rolling sand hills	40	1-4-6	180/VI:90/VII: 50/VIII	1-4-6	Public
	4	25	20	S$\frac{1}{2}$S$\frac{1}{2}$	160.00	Rough broken sand hills	20	1-4	110/VII:50/VIII	1-4	Public
	4	25	24	NW$\frac{1}{4}$	160.00	Rough broken sand hills	15	1-4	130/VII:30/VIII	1-4	Public
	4	25	30	SE$\frac{1}{4}$	160.00	Rough broken sand hills	20	1-4	125/VII:35/VIII	1-4	Public
	4	26	6	Lots 1,2,6,7;S$\frac{1}{2}$NE$\frac{1}{4}$; E$\frac{1}{2}$SW$\frac{1}{4}$	505.36	Steeply rolling sand hills	85	1-4-6	230/VI:195/VII: 80.36/VIII	1-4-6	Public
	4	27	4	Lot 1	53.12	Rough broken sand hills	5	1	40/VII:13.12/VIII	1	Private
	4	27	4	Lot 3	53.24	Rough broken sand hills	5	1	40/VII:13.24/VIII	1	Private
	4	27	28	E$\frac{1}{2}$	320.00	Rough broken sand hills	30	1	280/VII:40/VIII	1	Private
	4	27	30	Lots 10,11, & 12	110.18	Rough broken sand hills	14	1	100.18/VII: 10/VIII	1	Private
	4	27	34	SW$\frac{1}{4}$NW$\frac{1}{4}$;N$\frac{1}{2}$SW$\frac{1}{4}$;SW$\frac{1}{4}$SW$\frac{1}{4}$	160.00	Rough broken sand hills	20	1	130/VII:30/VIII	1	Private
	4	28	30	N$\frac{1}{2}$NE$\frac{1}{4}$	80.00	Gently to steeply rolling	12	1-4	VII	1-4	Public
	4	28	30	Lots 1 & 2	70.79	Gently to steeply rolling	10	1-4	VII	1-4	Public
	4	29	10	NE$\frac{1}{4}$	160.00	Steep, choppy sand hills	25	1-4	110/VI:50/VII	1-4	Public
	4	30	6	Lot 1	27.76	Gently to steeply rolling	5	1	VI	1	Private
	4	30	26	S$\frac{1}{2}$SW$\frac{1}{4}$	80.00	Gently to steeply rolling	15	1-4	55/VI:25/VII	1-4	Public
	4	31	24	NE$\frac{1}{4}$NE$\frac{1}{4}$	40.00	Gently to steeply rolling	7	1-3-4	VI	1-3-4	Public
	4	31	24	E$\frac{1}{2}$SE$\frac{1}{4}$	80.00	Gently to steeply rolling	15	1-3-4	VI	1-3-4	Public
	4	31	26	N$\frac{1}{2}$NE$\frac{1}{4}$	80.00	Gently to steeply rolling	15	1-3-4	50/VI:30/VII	1-3-4	Public
	4	32	18	Lot 3;NE$\frac{1}{4}$SW$\frac{1}{4}$	75.46	Gently to steeply rolling	14	1-4-6	VI	1-4-6	Public
	4	32	30	Lots 1,2,3, & 4	141.96	Gently to steeply rolling	27	1-4-6	100/VI:41.96/VIII	1-4-6	Public
	4	32	32	Lots 6,7, & 8	59.54	Gently to steeply rolling	12	1-3-4-6-9	VI	1-3-4-6-9	Public
	5	27	14	W$\frac{1}{2}$	320.00	Steeply rolling, broken	30	1	210/VI:90/VII 20/VIII	1	Private

Appendix A -- Description, classification, suitability, and proposed management of the public domain, by counties, within the Isolated Tract classification areas of the Upper Yellowstone River Area, Montana and Wyoming, 1960

Yellowstone County
Montana Principal
Meridian

	Twp North	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use	Land Capability Classification	Principal Suitability	Proposed Management
	5	27	28	NW¼	160.00	Steeply rolling, broken	20	1	90/VI:50/VII: 20/VIII	1	Private
	5	28	28	NE¼;NE¼SE¼	200.00	Rough broken sand hills	26	1	140/VI:60/VII	1	Private
	5	28	32	SW¼;SW¼SE¼	200.00	Rough broken sand hills	32	1	110/VI:90/VII	1	Private
	5	28	34	NE¼NE¼	40.00	Steep, rolling sand hills	7	1	VII	1	Private
	5	29	34	SE¼SW¼;SW¼SE¼	80.00	Gently to steeply rolling	12	1-4-6	VI	1-4-6	Public
	5	31	4	Lot 2	40.00	Steeply rolling broken	7	1	VI	1	Public
	5	31	14	SE¼SW¼;SW¼SE¼	80.00	Steeply rolling broken	15	1	VI	1	Public
	5	32	28	NW¼NE¼	40.00	Very steeply rolling	6	1	VII	1	Private
	5	33	32	SW¼NW¼;N½SW¼;SE¼SW¼	160.00	Very steeply rolling	20	1	VII	1	Public
1/	5	34	28	Lot 1	.14	Along the Yellowstone River					
2/	5	34	28	Lots 12,13,14,15,16,) 17,18)							
2/	5	34	29	Lots 9 & 10	)248.89	Island on the Yellowstone River	25	3-4	VI	3	Public
	5	34	30	Lot 1;NE¼NW¼;N½NE¼	159.60	Steep sandstone ridges	27	1	115/VI:44.60/VIII	1	Private
	6	28	32	SE¼SE¼	40.00	Rough broken sand hills	5	1	VII	1	Private
	6	28	34	NE¼NE¼	40.00	Rough broken sand hills	5	1	VII	1	Private
	6	31	8	N½NE¼;SE¼NE¼	120.00	Very steeply rolling	24	1	90/VI:30/VII	1	Public
	6	31	24	N½NE¼;NE¼NW¼	120.00	Very steeply rolling	16	1	70/VI:50/VII	1	Public
	6	31	24	NW¼SW¼	40.00	Gently to steeply rolling	8	1	25/VI:15/VII	1	Public
	6	31	34	W½SE¼	80.00	Gently to steeply rolling	12	1	60/VI:20/VII	1	Public
4/	6	32	22	W½	320.00	Gently to steeply rolling	64	1	VI	1	Private
	6	33	4	S½	320.00	Steep rolling sand hills	60	1	VII	1	Private
	6	33	10	W½	320.00	Rough rolling sand hills	60	1	VII	1	Private
	7	32	24	N½N½;NE¼NW¼;S½NE¼; NE¼SE¼	320.00	Rough rolling sand hills	60	1	VI	1	Private
	7	32	34	S½	320.00	Rough rolling sand hills	60	1	190/VI:130/VII	1	Private

Appendix A -- Description, classification, suitability, and proposed management of the public domain, by counties, within the Isolated Tract classification areas of the Upper Yellowstone River Area, Montana and Wyoming, 1960

Yellowstone County
Montana Principal
Meridian

	Twp South	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use	Land Capability Classification	Principal Suitability	Proposed Management
	1	23	14	NE¼NE¼;S½NE¼;SE¼NW¼; SE¼;SE¼SW¼	360.00	Rough broken and mountainous	60	1	330/VII:30/VIII	1	Private
3/	1	25	25	Lot 3	10.10	Along the Yellowstone River	--	3	VII	3	Public
2/	1	26	2	Lot 12	)						
2/	1	26	11	Lots 9 & 10	) 55.92	Island on the Yellowstone River	--	1	VI	3	Public
	1	26	14	Lot 3;SE¼NW¼;E½SE¼; S½SE¼	242.27	Rough broken shale hills	51	1	VII	1	Private
	1	26	21	E½NE¼;SW¼NE¼;SE¼NW¼	160.00	Rough broken shale hills	24	1	70/VI:90/VII	1	Private
	1	26	22	NW¼;SW¼NE¼;N½S½	360.00	Rough rolling shale hills	54	1	190/VI:140/VII: 30/VIII	1	Private
	1	26	23	NW¼SW¼	40.00	Rough broken shale hills	6	1	30/VI:10/VII	1	Private
	1	26	23	N½NE¼;NE¼NW¼	120.00	Rough broken shale hills	22	1	VII	1	Private
	1	26	24	W½W½	160.00	Rough broken shale hills	30	1	VII	1	Private
	1	26	25	NW¼NW¼	40.00	Rough rolling shale hills	7	1	VII	1	Private
	1	26	26	E½NE¼	80.00	Rough rolling shale hills	15	1	VII	1	Private
4/	1	26	29	W½NE¼;SE¼NE¼;NE¼SW¼	160.00	Steeply rolling shale hills	26	1	140/VI:20/VII	1	Private
	1	26	30	SE¼SW¼;SW¼SE¼	80.00	Steeply rolling shale hills	12	1	60/VI:20/VII	1	Private
	1	26	31	NW¼NE¼	40.00	Steeply rolling shale hills	7	1	30/VI:10/VII	1	Private
	1	27	30	SE¼SW¼	40.00	Gently to steeply rolling	8	1	VI	1	Private
	2	24	13	Lots 10 and 11	66.17)						
	2	24	14	Lot 7	.58)						
	2	24	23	Lot 13	2.35)	Island on the Yellowstone River	5	1	VII	3-4	Public
1/	2	24	22	Lot 7	1.09	Tract on the Yellowstone River					
3/	2	24	23	Lot 9	7.04	Along the Yellowstone River	3	1	VII	3	Public
3/	2	25	12	SE¼SW¼	40.00	Rolling	9	1	VI	1	Private
	2	25	18	Lot 12	40.00	Steeply rolling slopes	8	1	VI	1	Private
	2	25	35	NE¼SE¼	40.00	Gently to steeply rolling	10	1	VI	1	Private
	2	26	20	NW¼SW¼	40.00	Gently to steeply rolling	8	1	VI	1	Private
	3	24	10	NE¼SW¼	40.00	Rough broken hills	8	1	20/VI:20/VII	1	Private
	3	24	15	SW¼SE¼	40.00	Rough broken hills	10	1	VI	1	Private
	3	24	21	NE¼NE¼	40.00	Rough rocky broken hills	7	1	VII	1	Private
	3	24	21	NW¼SE¼	40.00	Steeply rolling hills	10	1	VI	1	Private
	3	25	31	Lot 2	40.00	Very steeply rolling, rocky	10	1	20/VI:20/VII	1	Private
	3	26	6	Lot 7	34.49	Gently to steeply rolling	12	1	VI	1	Private

Appendix A -- Description, classification, suitability, and proposed management of the public domain, by counties, within the Isolated Tract classification areas of the Upper Yellowstone River Areas, Montana and Wyoming, 1960

Yellowstone County
Montana Principal
Meridian

Twp South	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use	Land Capability Classification	Principal Suitability	Proposed Management
3	26	30	E½NW¼	80.00	Gently to steeply rolling	20	1	VI	1	Private
4	25	6	Lots 7,13,14,15,& 16	127.81	Rough broken steep hills	28	1	VII	1	Private
4	25	7	Lots 1,3,4,5,6,7,8,9, 10,11,12,13,14,15,16; SW¼NE¼;W½SE¼	828.49	Rough broken steep hills	143	1	VII	1	Private

Gallatin County
Montana Principal
Meridian

North	East									
1	7	20	E½E½	160.00	Steep and mountainous	16	3-4-7	VII	3-4-7	Public
3	7	30	E½NE¼	80.00	Steeply rolling	16	1	VI	1	Private
4	7	14	SW¼SE¼	40.00	Steep mountainside	8	1	VI	1	Private
South	**East**									
2	7	20	NE¼NE¼	40.00	Steeply rolling mountainous	6	1	VII	1	Private

Meagher County
Montana Principal
Meridian

North	East									
5	9	14	Lots 1,& 2;E½NW¼	159.68	Rough mountainous	13	1	VII	1	Private

Appendix A -- Description, classification, suitability, and proposed management of the public domain, by counties, within the Isolated Tract classification areas of the Upper Yellowstone River Area, Montana and Wyoming, 1960

Musselshell County
Montana Principal
Meridian

Twp North	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use	Land Capability Classification	Principal Suitability	Proposed Management
6	26	34	E$\frac{1}{2}$NE$\frac{1}{4}$;Lot 1;NE$\frac{1}{4}$SE$\frac{1}{4}$	159.36	Gently to steeply rolling	15	3-4-6-7	100/VI:59.36/VII	3-4-6-7	Public

Sheridan County
6th Principal
Meridian

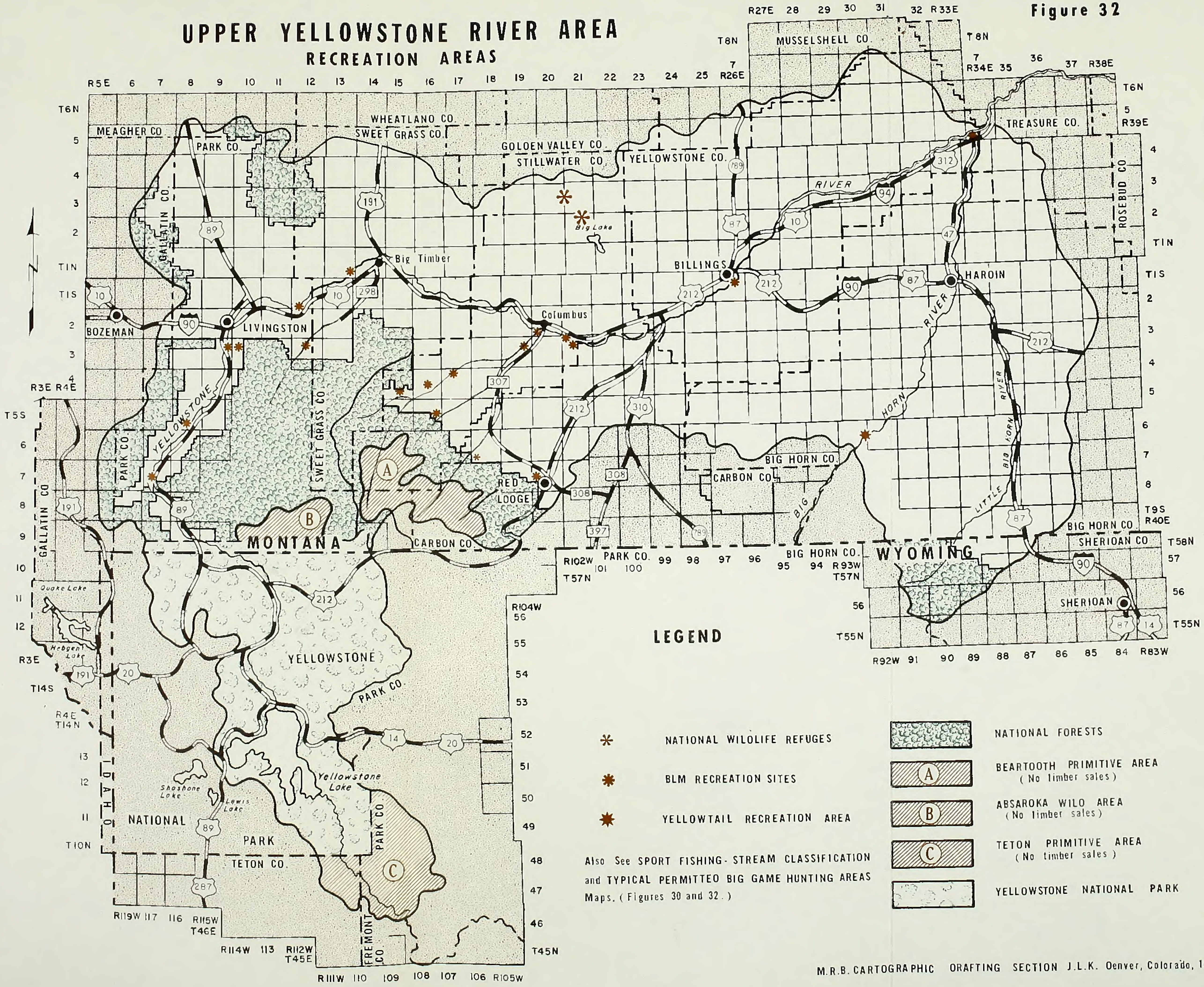
Twp	Range	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use	Land Capability Classification	Principal Suitability	Proposed Management
North	West									
3/ 57	88	14	Lot 1	13.91	Steeply rolling,range and woodland	-	1-4-6	VII	1-4-6	Public
3/ 57	88	15	Lots 5 & 6;S$\frac{1}{2}$SW$\frac{1}{4}$	163.35	Steeply rolling,range and woodland	-	1-4-6	VII	1-4-6	Public
3/ 57	88	16	Lot 3	25.92	Steeply rolling,range and woodland	-	1-4-6	VII	1-4-6	Public
58	89	20	NW$\frac{1}{4}$NW$\frac{1}{4}$	40.00	Rough and mountainous	2	3-4	VIII	3-4	Public

The following acreages were not classified because of confusion or conflict in county records, or because of inclusion of 247.38 acres under public sale M031924 which was later cancelled.

Twp	Range	Sec.	Subdivision	Acres
South	East			
1	11	2	Lot 1	47.38
1	11	10	W$\frac{1}{2}$SW$\frac{1}{4}$	80.00
1	11	22	NW$\frac{1}{4}$NW$\frac{1}{4}$	40.00
1	11	24	E$\frac{1}{2}$SE$\frac{1}{4}$	80.00
2	8	30	NE$\frac{1}{4}$NW$\frac{1}{4}$	40.00
2	12	10	SE$\frac{1}{4}$NW$\frac{1}{4}$	40.00
4	25	18	SE$\frac{1}{4}$SE$\frac{1}{4}$	40.00
6	18	20	SE$\frac{1}{4}$SW$\frac{1}{4}$	40.00
6	21	5	SE$\frac{1}{4}$SE$\frac{1}{4}$	40.00
North	East			
3	31	4	Lots 1,2,3, & 8	105.12
4	27	18	Lot 10	31.94

Figure 32

UPPER YELLOWSTONE RIVER AREA
RECREATION AREAS



M.R.B. CARTOGRAPHIC DRAFTING SECTION J.L.K. Denver, Colorado, 1963.

Appendix B - Recreation

Creation of tourist facilities goes on at all degrees of accomodation, varying from rest stops along the roadside through full-scale facilities even including boat-launching docks. The camping and picnicking areas following are those recognized by the State of Montana as peculiarly adapted to the highway-bound traveler. Camping facilities off the highways differ from those above in that most are federally maintained, usually by the U. S. Forest Service and must be located by the individual tourist through enquiry at the forest headquarters.

Abbreviations

W - Water
S - Stoves or Fireplaces
Ta - Tables
T - Toilets
F - Fishing
B - Boating (bring your boat)
Sw - Swimming
FS - U. S. Forest Service
CP - City Park
HC - Mont. Highway Comm.
SP - State Park
SFS - State Forest Service

All campgrounds are open to the public free of charge.
Overnight camping is permitted, unless specified otherwise.

Along U. S. Highway 10

Big Timber City Park. W-T-F. Space for 10 trailers.
Big Timber Lions Club Park, at Big Timber. W-T-Ta-S.
Picnic Site. HC, 3 miles east of Big Timber. Ta. Space for 4 trailers.
Picnic Site, 25 miles south of Big Timber on Natural Bridge and Falls of Main Boulder.
Fireman's Point, American Legion and Columbus Fire Dept. Three miles southwest of Columbus on Stillwater River. Ta-T-F. Space for 12 trailers.
Campsite. HC, 5 miles west of Columbus. Ta-F. Trailer Space.
Park City Park. CP at Park City. Ta. Picnicking only.

Along U. S. Highway 10 and 312

Picnic Site. HC, 2 miles west of Huntley. Ta. Space for 3 trailers.
Huntley Park. FFA. W-S-Ta-T. Space for 20 trailers.
Highway Park. HC, ten miles east of Pompey's Pillar. Ta. Trailer space.
Custer Park. CP, at Custer. W-Ta. No overnight camping.
Picnic Site, HC at Big Horn. Ta. No overnight camping.

Along U. S. Highway 87

Campsite, HC and 4H Club. Seven miles north of Lodge Grass. Ta-T. Space for 10 trailers.
Crow Agency, HC. One mile south of Crow Agency. Picnicking only. Ta-T. No overnight camping.
Hardin City Park. Picnicking only. No overnight camping. W-Ta-T.
Picnic Site, HC 20 miles west of Hardin. Ta. No overnight camping.
Campsite, HC 13 miles east of Billings. Ta. Trailer space.

Along U. S. Highway 89

Pine Creek, FS 15 miles south of Livingston, 2 miles off highway. W-S-Ta-T-F. Trailer space.
Carters Bridge. Five miles south of Livingston. S-Ta-F-B. Space for 5 trailers.
Keyes Camp Site, HC 15 miles north of Livingston. Ta-T. Picnicking only.

Along U. S. Highway 212

Chief Joseph Camp, FS 4 miles east of Cooke City. W-Ta-S-T. Trailer space.
MK Camp, FS 14 miles south of Red Lodge, 2½ miles off highway. W-S-Ta-T-F. Trailer space.
Parkside, FS 14 miles south of Red Lodge. W-S-Ta-T-F. Trailer space nearby.
Ratine, FS 8 miles south of Red Lodge, ½ mile off highway. W-S-Ta-T-F. No trailer space.
Sheridan, FS 7 miles south of Red Lodge, ½ mile off highway. W-S-Ta-T-F. No trailer space.
Basin Creek, FS turn west just south of Red Lodge city limits, 7 miles off highway on West Fork of Rock Creek. W-S-Ta-T-F. No trailer space
Palisades, FS turn west, south of Red Lodge, 2 miles off highway. W-S-Ta-T-F.
Cascade, FS turn west, south of Red Lodge, 10½ miles off highway on West Fork of Rock Creek. W-S-Ta-T-F. Trailer space.
Red Lodge City Picnic Grounds. W-S-Ta-T-F. Overnight camping permitted. Space for 10 trailers.
Joliet Park, CP at Joliet. Ta-F. No overnight camping.
Laurel City Park, 2 miles south of Laurel. W-S-Ta-T-F. Trailer space.
Picnic Site, HC 3 miles east of Laurel. Ta. Space for 10 trailers.

Along U. S. Highway 310

Fromberg Park, CP at Fromberg. W-Ta-T-S. Picnicking only.

Along Montana Highway 3

Airport Park, Billings Garden Club, at Billings Airport. W-Ta. Picnicking only.

Campgrounds in Yellowstone National Park

Tower Falls, Near Tower Junction. Ta-T-F. Trailer space.
West Thumb, On Yellowstone Lake. W-S-Ta-T-F-B. Trailer space.
Fishing Bridge, On Yellowstone Lake. W-S-Ta-T-F-B. Trailer space.
Mammoth, at Mammoth Hot Springs. W-S-Ta-T-F. Trailer space.
Canyon, at Canyon Falls. W-S-Ta-T-F. Trailer space.
Cascade, 3½ miles north of Lake Jct. 15 day limit.
Pebble Creek, 7 miles southwest of NE entrance. 30 day limit.
Pelican Creek, 1½ miles east of Lake Jct. 30 day limit.
Slough Creek, 10 miles east of Tower Falls. 30 day limit.

Fishing Access

The State of Montana's public fishing access "points" in the Yellowstone drainage are at the locations below. Access to the mainstream of the Yellowstone may also be located through federal lands on the base map accompanying this report and along the right-of-way of the Northern Pacific Railroad.

Stillwater Drainage

Stillwater River, 6 miles south of Columbus, 4.10 acres.
Johnson Bridge, 3 miles south of Absarokee, 2 acres
Nye Bridge, 3 miles south of Nye, 6 acres.
Rosebud Isle, Fishtail, 9.80 acres.

Yellowstone Drainage

Rock Creek, between Red Lodge and Roberts, approximately 69 acres.
Rock Creek, between Red Lodge and Roberts, approximately 32 acres.
Rock Creek, between Red Lodge and Roberts, approximately 19 acres.
Rock Creek, between Red Lodge and Roberts, approximately 41 acres.
Rock Creek, between Red Lodge and Roberts, approximately 84 acres.

Lakes

Dailey Lake, 22 miles south of Livingston, 122 acres.

No facilities available, camping and trailer houses allowed where space will permit.

Outfitters and Packers

Areas off the highway are accessible only for short hiking trips, full-scale packing outfits are necessary for use in remote areas. A group of responsible organized outfitters, recognized by the State of Montana, in the Upper Yellowstone Area follows:

Beartooth Ranch, Nye, Montana.
Black Otter Guide Service, Livingston, Montana.
D. Bar Y Ranch, Bridger, Montana.
Double Y Bar Ranch, Nye, Montana.
4K Guest Ranch, Fishtail, Montana.
Piney Dell Lodge, Red Lodge, Montana.
Sixty-Three Quarter Circle Ranch, Livingston, Montana.

Ski Areas

Close to the metropolitan concentrations of population of the Billings-Laurel complex two ski areas headquartered out of Red Lodge provide recreational facilities.

Red Lodge and Grizzly Peak. Altitude 7,400 to 9,400 feet. Snow Season December to May 1st.
5 slopes 3/4 to 1-1/4 miles. Trails and slopes cut from timber.
Beginners terrain to high intermediate and expert.

Recreational Sites Withdrawn by the Bureau of Land Management

Appendix B (Continued)

Location	Approximate acreage	Name of Site or Area	Recreation Value
1. T. 5 N., R. 34 E Sec. 28: Lots 12 through 18 Sec. 29: Lots 9 & 10	248.89	Big Horn Island	Attractive timbered island - excellent wildlife sanctuary - rest stop for boats on river - has historical background since it is near the site of the Manuel Lisa fur trading post, one of the first established in Montana.
2. T. 1 S., R. 26 E Sec 2: Lot 12 Sec 11: Lots 9 & 10	55.92	Josephine Island	Timbered island located adjacent to Billings. Reportedly the highest point reached by steamboat (named Josephine) on the Yellowstone River. Located just under imposing rimrocks. Good rest stop for boaters.
3. T. 3 S., R. 21 E Sec.8: Lot 1 Sec.9: Lots 5 & 9	40.00	Tutt Creek	Fishing access to Yellowstone River.
4. T. 3 S., R. 21 E. Sec. 6: Lot 1	25.00	East Columbus	Fishing access from U. S. Highway # 10 to Yellowstone River.
5. T. 1 N., R. 13 E. Sec. 35: Lots 4 & 5	45.24	Yellowstone Bridge	Has legal access and provides fishermen access to Yellowstone River. It is also used as a launching site for boats and rubber raft trips down the Yellowstone. Very pleasant tract with lush grassy meadows ideally suited for campground or picnic site development.
6. T. 1 S., R. 12 E Sec. 29: Lots 4 & 5 Sec. 32: Lots 5,6, & 7 Sec. 33: W$\frac{1}{2}$NW$\frac{1}{4}$, NW$\frac{1}{4}$SW$\frac{1}{4}$	176.34	McAdow's Canyon	Provides excellent public fishing access along prime section of Yellowstone River.
7. T. 2 S., R. 12 E Sec. 5: Lots 5 & 6	23.65	Buffalo Hump	Fishing access to Yellowstone River, also has site potential for campground and picnic area.
8. T. 3 S., R. 10 E Sec. 17: S$\frac{1}{2}$NW$\frac{1}{4}$, NE$\frac{1}{4}$SW$\frac{1}{4}$ Sec. 18: SE$\frac{1}{4}$NE$\frac{1}{4}$	160.00	Suce Creek	Fishing access to Suce Creek, also a scenic area for hiking near the Gallatin National Forest.
9. T. 3 S., R. 9 E Sec. 14: Lot 5	29.48	Dupuyat Ranch	Fishing access to Yellowstone River, also a picnic site area.
10. T. 5 S., R. 8 E Sec. 27: NE$\frac{1}{4}$NW$\frac{1}{4}$	40.00	Emigrant	Pleasant site adjoining U. S. #89, the northern gateway to Yellowstone National Park.

11.	T. 7 S., R. 7 E Sec. 20: Lot 4	28.43	Carbella	Fishing access to Yellowstone River. The scenery of the Gallatin and Absaroka Ranges to the west and east respectively, compliment this feature.
12.	T. 4 S., R. 15 E Sec. 27: NE¼SW¼	40.00	West Fork Stillwater	Fishing access to Stillwater River. Beautiful setting - excellent climate for picnicking also many interesting trails available in nearby National Forest for hiking and riding.
13.	T. 4 S., R. 16 E Sec. 22: SE¼NW¼, NE¼SW¼	80.00	Stillwater #1	Fishing access to Stillwater River. Also outstanding scenery, ideal camping conditions (shelter, terrain, etc.,) and good game hunting.
14.	T. 4 S., R. 17 E Sec. 4: SW¼NE¼, SE¼NW¼ NE¼SW¼, NW¼SE¼	160.00	Stillwater #2	Fishing access to Stillwater River. Quite scenic with a good view of high mountain country.
15.	T. 3 S., R. 19 E Sec. 14: Lot 8 Sec. 22: Lots 2 & 3, NE¼NE¼ T. 3 S., R. 20 E Sec. 6: Lots 11 & 12	135.76	Stillwater #3	All tracts are along Stillwater River, however, there is no public access.
16.	T. 2 S., R. 20 E Sec. 31: Lots 3 & 6, SE¼NE¼ Sec. 32: Lots 2 & 3	172.03	Lower Stillwater	Fishing access to Stillwater River.
17.	T. 3 S., R. 12 E Sec. 9: W½NE¼	80.00	West Boulder	Fishing access to West Boulder River. Very scenic area with high mountains in the background.
18.	T. 5 S., R. 16 E Sec. 14: SW¼SW¼	40.00	Dean	Ideal for cabin sites. Very scenic area adjoining the Custer National Forest. Accessible year round by all-weather road; electricity and telephone available.
19.	T. 7 S., R. 20 E Sec. 29: SW¼SW¼	40.00	Palisade	Has potential for either cabin site development or community recreation area. Tract is just below mountain face and has an unspoiled mountain view, with limestone palisades visible to west. No legal access at this time.
20.	T. 9 S., R. 22 E Sec. 20: SE¼ Sec. 29: Lot 9, NE¼, E½SE¼ Sec. 32: NE¼NE¼	464.33	Clarks Fork of the Yellowstone River	Fishing access to the Yellowstone River.

Recreational Sites Withdrawn by the Bureau of Land Management

Appendix B (Continued)

21.	T. 8 S., R. 24 E Sec. 29	640 acres in sec. (less than 1 acres in site)	Indian Painting Site	Historical and archeological value of the two Indian paintings on one large boulder (10 - 12 feet high and 8-9 feet in diameter).
22.	T. 8 S., R. 28 E Sec. 21	640 acres in sec. (less than 1 acre in site)	Mystery (Mystic) Caves	Geological formations inside cave.
23.	T. 9 S., R. 26 E Sec. 35	743.74 acres in sec. (less than 10 acres in site)	Indian Pictograph Sites	Historical and archeological value of the pictographs.
24.	T. 5 S., R. 23 E Sec. 35: SW¼SE¼	40.00	Blue Water Creek #1	Fishing access to Blue Water Creek.
25.	T. 6 S., R. 24 E Sec. 8: SE¼NE¼	40.00	Blue Water Creek #2	Fishing access to Blue Water Creek.
26.	T. 6 S., R. 23 E Sec. 27: Lot 4	2.72	Bridger Recreation Area	Located on Clarks Fork of the Yellowstone River, however, no legal access.

Appendix C Method of Inventory

A detailed land classification of the lands administered by the Bureau of Land Management in the Upper Yellowstone Area was made on public domain lands and those acquired under the Bankhead-Jones Act.

In the first group, those lands which have always been part of the public domain, only 61,000 acres of the entire basin still remain as those lands vacant and unappropriated. Acquired lands within the Upper Yellowstone Basin total 72,000 acres. Thus acreages of lands returned to federal ownership exceed those of the original public domain.

The isolated tracts of public domain were examined separately and recommended classifications were made in accordance with Bureau procedure. Acquired lands were inventoried with recommendations for management rather than disposal. Inventory procedures were identical in either the isolated tracts or that of the acquired lands.

Techniques of Inventory

The following is a brief semi-technical description of the ecological system of rating rangelands.

The ecological or range condition system of range classification, was used to inventory the Upper Yellowstone River Basin. This presents the capabilities of the public domain in terms of quantity and kind of forage and relates the present condition of this range to those potentials. A part of this includes a utilitarian soil survey.

Definitions

Range, for the purposes of the inventory, was defined as land on which the original plant community (the climax) is composed principally of native grasses, forbs and shrubs. This includes lands with uneconomic grazing value, such as desert, badlands and other naturally barren and semi-barren lands which must be evaluated for recreation, wildlife and watershed.

Range classification by condition classes rests on two essential concepts. The first is that of the range site. As an example of a range site, a deep-soiled bottom of a broad valley receives extra water through runoff. The plants on this bottomland will produce more than the neighboring shallow-soiled ridges and they may not even share a single plant species. The second essential concept is that of a climax or original vegetation that grew in the unique environment of each range site.

Range site boundaries can be located because each range site can be described in terms of climate, soil depth and texture, topography, parent materials, alkalinity or acidity, stoniness, slope, exposure and organic matter. This creates a sum of environments peculiar to each range site which in turn creates its own characteristic plant community.

Range sites are permanent, their climax plant communities therefore will always re-establish. The plant cover may be modified by drouth, grazing, fire or even farming, but the effect is temporary, the potential of the range site is not permanently changed. Sometimes if these influences are so drastic and prolonged as to change the original range site then a new range site with its altered potential is described. One range site with similar soils and topography will have different potentials under different rainfall. Great differences in forage production are found under differing rainfall, therefore, a range site may be divided into precipitation zones.

Only two criteria can determine a new range site. It must have (1) differences in the kinds of plants in the original plant community, or (2) differences in the total production, or both. These differences in the kind or amount of vegetation must be great enough to require some variation in management.

Field Guides

Field work and investigation covering several years goes into the preparation and revision of the guides used for classification. The potential for the range site and the composition of the original plant community must be determined. That of the range site is simpler, but that of the original plant community is more difficult. The range site is not uniform, therefore, the original vegetation for any site is made up of a characteristic grouping of species -- not as precisely defined percentages.

To determine the original plant community for a site a search is made for relict vegetation on protected or relatively undisturbed areas. A degree of disturbance is normal on all sites, such disturbance may or may not be the result of livestock grazing. However, it can be assumed the plant community found on areas with the least disturbance will represent the potential for the range site. Grazing district and experiment station ranges and records are inspected for those grazed areas with known records of past use. A special search is made of scientific literature and of historical accounts. The evidence from any one of these sources is seldom conclusive in itself -- all must be considered.

Range Condition

Range condition is described as Excellent, Good, Fair, or Poor. These show the degree to which the plant composition (estimated to the nearest five percentage of each plant [1]) departs from that of the potential plant community. Today's plants are compared to their relative abundance in the potential or original plant community.

Range condition is determined by listing the plants now present and then comparing them to the potential or the original vegetation for that site. If a particular range is described as being in Good condition or Poor condition, the terms are used with reference to a standard established for that range site, this standard is based on the original kinds and amounts of plants that range site can produce. This standard is often termed the "climax vegetation"; it is the vegetative benchmark of range condition.

Plant Reactions in Determining Range Condition

Plants respond differently to grazing use on each range site. They are grouped in three groups: decreasers, increasers, or invader plants.

Decreaser plants are those plants of the original plant community which dwindle, relative to the other plants, with continued heavy grazing, drouth, wrong season of use, etc. They are perennials usually palatable to livestock and often dominant. The total percentages of all decreaser plants are added as one step in determining the range condition.

Increaser plants are those plants of the original plant community which replace the decreaser plants (hence, increase in abundance). Plants that increase at first may later dwindle under continued adverse conditions. Increaser plants are often shorter and less productive. Their forage value varies from high to low. Under grazing low-value increaser plants usually increase faster than high-value increaser plants. Increaser plants are limited in their occurrence in the original plant community by the already present decreaser plants, and increasers in their present abundance are counted up to but not exceeding these limits. Again relative percentages are used. The decreasers percentage at time of inventory plus that of the increasers (but only to the latter's occurence in the original community) are totaled to get the range condition classification in percent. The score is 0-25 percent - Poor; 25-50 percent - Fair; 50-75 percent - Good; and over 75 percent is rated Excellent.

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[1] The estimate is by volume production, the relative quantities produced by each species. This includes all photosynthetic surfaces. Pricklypear, for instance, will have succulent pads many years old, which compete for light and water. Brush, on the other hand, would be considered only as to the annual growth of new twigs and leaves.

Invader plants are those which are not a part of the potential plant community of the range site. They may be normal to other range sites. Invaders include woody plants, herbaceous perennials and annuals. No invader plant is counted in determining the range condition class.

Results

Management is not predicated upon attaining high scores in range condition. It is based on the appropriate kinds of plants on the range and their proportion. Winter range with browse, or spring range with annual grasses might indeed be far from the original plant community for the site, yet meet the exact need for proper economic management. The ecological system of range inventory uses the original plant community only as the benchmark to which the ever-changing rangelands can be referenced. The potential is dynamic, but the environment of the range site and the climate so shape the community that even in change its general form is predictable in any stage.

Appendix D Early Explorations

The earliest narrative of the Upper Yellowstone Area is that of the Verendryes. In the mid-eighteenth century they crossed overland into the Upper Yellowstone Basin and reached a point where apparently they could see the Big Horn Mountains, which they termed "Shining Mountains". Unfortunately their account is impossible to relate to the present day locations; it was prepared after they returned to their headquarters.

The first person to cross into the Upper Yellowstone Basin and give an accurate narrative was Francois Antoine Larocque, an employee of the Northwest Fur Company. In 1805, after being refused permission to accompany the Lewis and Clark Expedition, Larocque joined a band of Crows returning west for a trip lasting four and one-half months. He crossed the basins of the Little Missouri, Powder and Tongue, and reached the Yellowstone River on September 10, 1805, near the present day site of Billings, Montana, here he returned downstream, but overland.

His comments on vegetation and wildlife refer to the eastern part of the basin and most of his remarks on topography were on the lower part of the area of this report.

Larocque accomplished his aim of establishing friendly relationships with the Crows, of teaching methods to skin-out and preserve furs preferred by his company. Without incident he was to reach Fort LaBosse on the Assiniboine River, October 17, 1805.

The next group, who prepared notably clear and explicit descriptions of the country, was that of Captain Meriwether Lewis and his co-captain William Clark. They explored up the Missouri, crossed over the Continental Divide into the Columbia River Basin and eventually reached the Pacific Ocean.

Returning east the party split in two, one group under Lewis explored the Marias River, the other under Clark crossed the divide between the Three Forks and the Yellowstone and entered the Upper Yellowstone drainage on July 18, 1806. Clark rode overland for five days down the "Rochejhon" until he found suitable timber for canoes. The rest of Clark's trip was by canoe down to the mouth of the Yellowstone where he joined Lewis.

The Lewis and Clark Expedition was most successful; they returned to their base at St. Louis. Clark eventually married the girl he named the Judith River after. Lewis, unfortunately, in 1809, while he was enroute to Washington, D. C., was murdered.

In 1859, a party of Topographical Engineers under the command of Captain Raynolds, came up the Yellowstone River. He sent a party, under Lt Maynadier, south up Tullocks Creek to the headwaters of the Tongue. Raynolds went on to the mouth of the Big Horn River and rode upstream and southward to winter on the Platte River.

The next spring the party reached the Wind River; there Lt Maynadier went north down the Wind River and Big Horn, while Raynolds went further west up the Wind River into the Jackson Hole country. His immediate goal was Yellowstone Park. He failed because of the combination of unusually heavy snow or steep cliffs and was forced most reluctantly to go on to the rendezvous on the Three Forks. Lt Maynadier, in the meantime, had crossed from the Big Horn to the Clarks Fork, came down to the Upper Yellowstone River and traveled cross-country westward to meet his superior at Three Forks.

Maynadier met his superior at the rendezvous;he then returned down the Yellowstone, making observations on the trip on vegetation and the soils. Part of his trip was in a "skin-boat" which made the journey successfully down the river. In 1860 the entire party, having covered most of the country between the Missouri and the Yellowstone, returned to Washington.

Raynolds narrative, unfortunately, was not published until after the Civil War. His observations are accurate and his predictions, especially on the fate of the game, the trafficability of the rivers, and the feasibility of rail transportation, all proved to be well-founded.

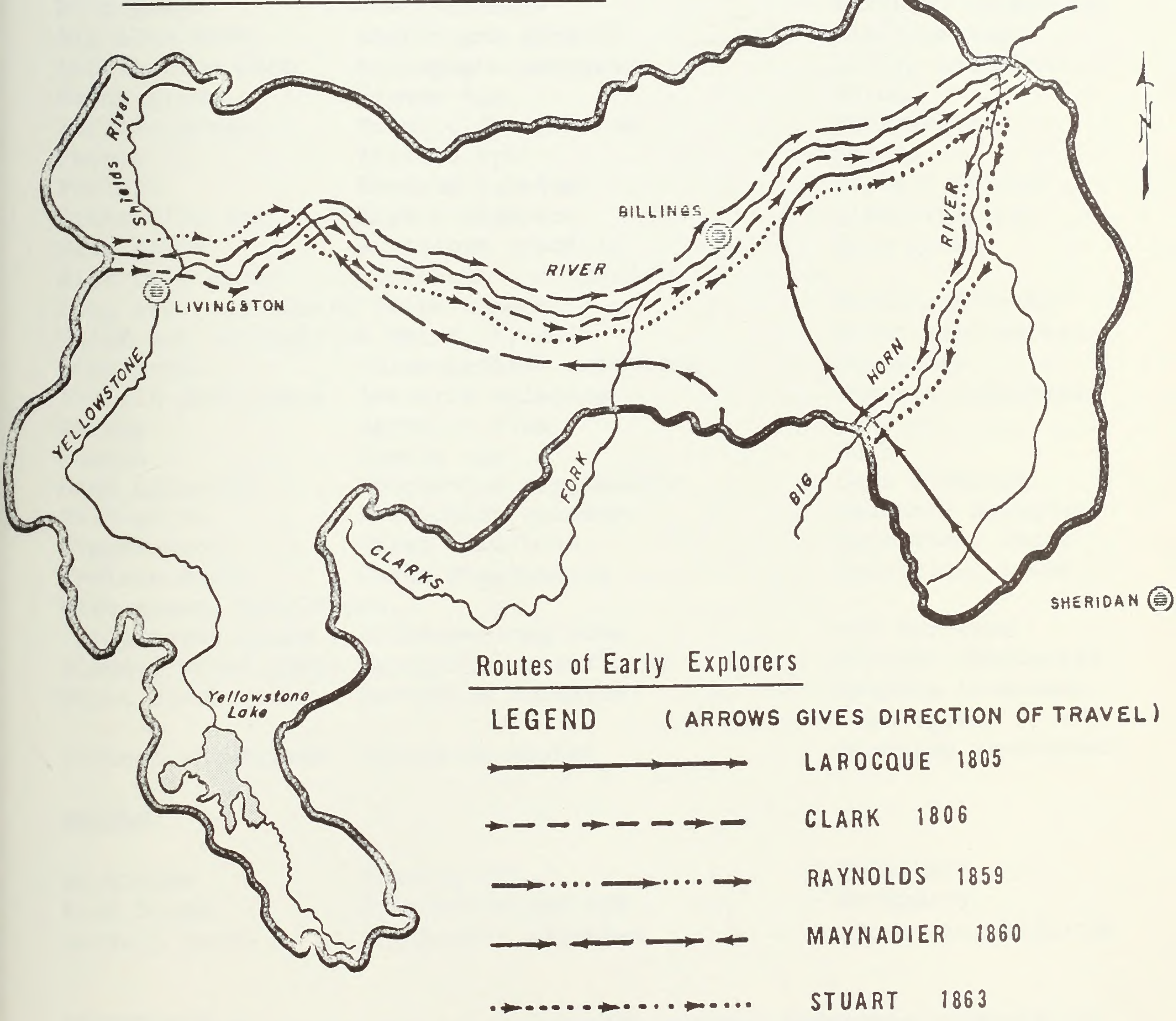
In 1863 a group of miners, under James Stuart, left Virginia City, and traveled east to skirt the eastern slope of the Big Horn Mountains and thence south towards the Platte and up the Sweetwater to get to South Pass City. The first part of their trip, along the Upper Yellowstone, was uneventful and Stuart's journal is characterized by many observations on grass, noxious plants and wildlife. After the party turned south at the mouth of the Big Horn serious trouble developed with the Indians; eventually the party was to reach South Pass City and safety only after leaving several dead on the trail.

Thus the time span of useful early reports runs from 1805 to 1863. A later report, after settlement, was the general reconnassiance of all of the Upper Yellowstone Area by U. S. Geological Survey in 1924. This is quoted in detail in the main body of the report.

A good recountal exists for over 150 years for this sub-basin history of vegetation, of soils, of erosion, of the sediment load, of the wildlife and its distribution. We owe a debt of thanks to these men for their dedication to detail and their determination to record the incidents of early life.

It should be added that John Colter, a member of the Lewis and Clark Expedition, was the first to explore, in 1807, the upper reaches of the Yellowstone around the site of present day Yellowstone Park. His tales were considered wild exaggerations and not to be believed.

UPPER YELLOWSTONE RIVER AREA



Appendix E

Guide to Plant Names as used in U. S. Geological Survey 1924 Land Classification

U. S. G. S. Land Classification 1924		Standardized Plant Names
Common Name	Scientific Name 1/	Common Name
GRASSES AND GRASSLIKE PLANTS:		
Blow out grass	Redfieldia flexuosa	Blowoutgrass
Blue grass	Poa pratensis	Kentucky bluegrass
Big blue stem	Andropogon gerardi	Big bluestem
Little blue stem	Andropogon scoparius	Little bluestem
Brome grass	Bromus spp.	Brome
Buffalo grass	Buchloe dactyloides	Buffalograss
Fescue	Festuca spp.	Fescue
Foxtail	Hordeum jubatum	Foxtail barley
Giant wild rye	Elymus cinereus	Giant wildrye
Blue grama	Bouteloua gracilis	Blue grama
Side oats grama	Bouteloua curtipendula	
Long awn needlegrass	Stipa comata	Needleandthread
Short awn needlegrass	Stipa viridula	Green needlegrass
Pine grass	Calamogrostis rubescens	Pinegrass
Prairie june grass	Koeleria cristata	Prairie junegrass
Redtop	Agrostis alba	Redtop
Rushes	Juncus spp.	Rush
Sand dropseed	Sporobolus cryptandrus	Sand dropseed
Salt grass	Distichlis spicata	Seashore saltgrass
Nigger wool	Carex filifolia	Threadleaf sedge
Prairie sedge	Carex stenophylla	Needleleaf sedge
Wire grass, triple awn, or poverty grass	Aristeda longiseta	Red threeawn
Slender wheat grass	Agropyron pauciflorum	Slender wheatgrass
Wheat bunch grass	Agropyron spicatum	Bearded bluebunch wheatgrass
Western wheatgrass	Agropyron smithi	Bluestem wheatgrass
SHRUBS:		
Buckthorn	Rhamnus spp.	Buckthorn
Buck brush	Symphoricarpos spp.	Snowberry
Buffalo berry	Shepherdia argentea	Silver buffaloberry

1/ Scientific names are in accord with current taxonomic nomenclature

Appendix E (Continued

U. S. G. S. Land Classification 1924		Standardized Plant Names
Common Name	Scientific Name 1/	Common Name
SHRUBS:		
Chaparral	Ceanothus spp.	Ceanothus
Chokecherry	Prunus melanocarpa	Black chokecherry
Cinquefoil	Pontentilla fruticosa	Bush cinquefoil
Creeping juniper	Juniperus spp.	Juniperus
Currant	Ribes spp.	Currant
Gooseberry	Grossularia spp.	Gooseberry
Greasewood	Sarcobatus vermiculatus	Black greasewood
Kinnikinnick or Bearberry	Arctostaphylos uva-ursi	Bearberry kinnikinnick
Matchweed	Gutierrezia sarothrae	Broom snakeweed
Mountain mahogany	Cercocarpus	True mountain mahogany
Oak brush	Quercus spp.	Oak
Prickly pear	Opuntia spp.	Prickly pear
Rabbitbrush	Chrysothamnus spp.	Rabbitbrush
Black sagebrush	Artemisia tridentata	Big sagebrush
Bud sagebrush	Artemisia spinescens	Bud sagebrush
Green sagebrush	Artemisia dracunculoides	Falsetarragon sagebrush
Mountain sagebrush	Artemisia frigida	Fringed sagebrush
Sand sagebrush	Artemisia filifolia	Sand sagebrush
Valley sagebrush	Artemisia cana and	Silver sagebrush
	Artemisia gnaphalodes	Cudweed sagebrush
Shadscale	Atriplex confertifolia	Shadscale saltbush
Salt sage	Atriplex gardneri	Gardner saltbush
Soapweed	Yucca glauca	Small soapweed
Squawberry	Shepherdia canadensis	Russet buffaloberry
Serviceberry	Amelanchier alnifolia	Saskatoon serviceberry
Wild red plum	Prunus americana	American plum
Wild rose	Rosa spp.	Rose
Willows	Salix spp.	Willows
Winter fat	Eurotia lanata	Common winterfat
WEEDS:		
Astragalus	Astragalus spp.	Loco; milkvetch; poisonvetch
Balsam root	Balsamorhiza sagittata	Arrowleaf balsamroot
Butterweed	Senecio spp.	Groundsel

1/ Scientific names are in accord with current taxonomic nomenclature

Appendix E (Continued)

U. S. G. S. Land Classification 1924		Standardized Plant Names
Common Name	Scientific Name 1/	Common Name
WEEDS:		
Daisy	Erigeron spp.	Fleabane
Gumweed	Grindelia squarrosa	Curleycup gumweed
Loco weed	Oxytropis spp.	Crazyweed
Lupine	Lupinus spp.	Lupine
Phlox	Phlox hoodi	Hoods phlox
Psoralea or wild alfalfa	Psoralea tenuiflora and Psoralea argophylla	Slimflower scurfpea Silverleaf scurfpea
Purple cone flower	Echinacea angustifolia	Blacksamson echinacea
Russian thistle	Salsola kali	Russianthistle
Stickweed	Lappula occidentalis	Stickseed
Sunflowers	Helianthus and Helianthella spp.	Sunflower
Thistle	Carduus spp.	Bristlethistle
Vetch	Vicia spp.	Vetch
Wild buckwheat	Eriogonum spp.	Eriogonum
Wild flax	Linum lewisi	Lewis flax
Yarrow	Achillea millefolium	Common yarrow
TREES:		
Ash	Fraxinus spp.	Ash
Aspen	Populus tremuloides	Quaking aspen
Balsam or alpine fir	Abies lasiocarpa	Alpine fir
Box elder	Acer negundo	Box elder
Cottonwood	Populus spp.	Cottonwood
Cedar or juniper	Juniperus spp.	Juniper
Douglasfir	Pseudotsuga menziesi	Common Douglasfir
Elm	Ulmus americana	American elm
Engelmann spruce	Picea engelmanni	Engelmann spruce
Limber pine	Pinus flexilis	Limber pine
Lodgepole pine	Pinus contorta latifolia	Lodgepole pine
Western yellow pine	Pinus ponderosa	Ponderosa pine

1/ Scientific names are in accord with current taxonomic nomenclature

Appendix F

Definitions of Land Classes Used in 1924

Irrigated and Irrigable Land:

Deep soils, actually irrigated or potentially irrigable land already under a ditch.

Dry-Farming Land:

Dry-farming land had a smooth surface. Climatic conditions, soil texture, and fertility were favorable to succesful production of hardy grain crops in most years. Soil textures ranged from sandy-loam to clay-loam; the minimum precipitation was from 14 to 20 inches; 50 percent or more of the total precipitation occurred from May to September, with a growing season of 100 to 120 days.

Farming-Grazing Land:

Farming-grazing land had a smooth to gently rolling surface. Climate, soil texture, and fertility were favorable to the successful production of grain crops 75 percent of the time, but yields were less. Soil texture ranged from sandy-loam to clay-loam, and the minimum precipitation was from 12.5 to 17 inches; 50 percent or more of the total precipitation occurred during the 6 month period from April to September. This was land on which a farmer could earn a livelihood every year and make a moderate profit for at least two-thirds of the years.

Grazing-Forage Land:

Grazing-forage land had a smooth to gently rolling surface. Climate, soil texture, and fertility were such that grain crops could be successfully produced only occasionally. Soils in this classification had a friable texture but were clay or coarse-sandy to gravelly type, either incapable of readily absorbing or retaining moisture. Normal rainfall rained from 10.5 to 13 inches. Wheat or rye, cut green for hay, was considered the only sure crop on this land. Most of the area thus classified would always be used for livestock grazing.

Grazing Land:

Grazing land was divided into two classes: tillable and non-tillable. Tillable grazing land was relatively smooth and physically tillable, which, because of low rainfall or heavy or shallow soil, was unfit for profitable production of crops. Non-tillable grazing land included all remaining lands that could be used only for grazing or timber production, rough broken mountain slopes and plains dissected by erosion into rough breaks and badlands, as well as gravel terraces.

Missouri River Bottom-land:

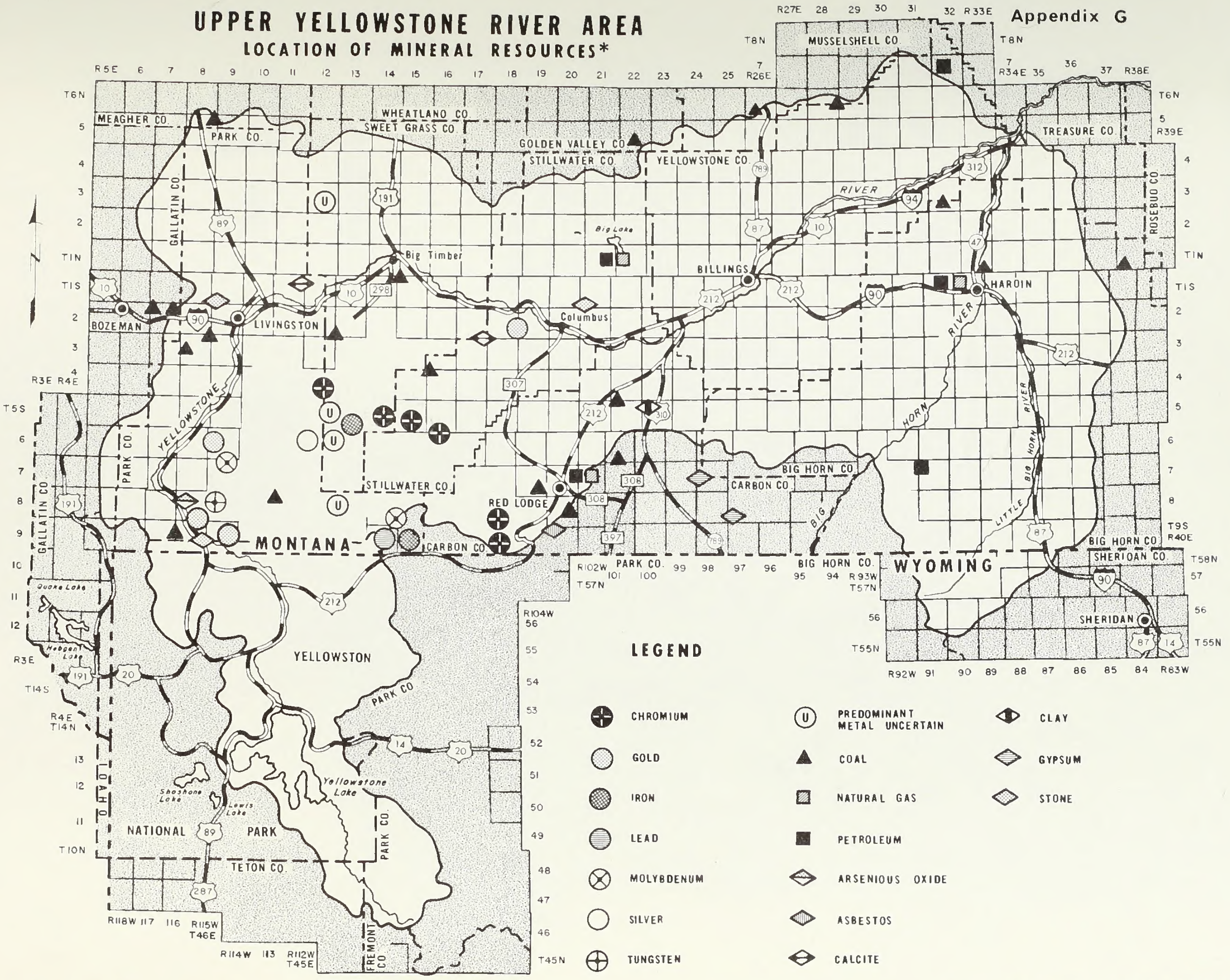
These were river-bottom lands between nearly parallel lines of bluffs; the alluvial plains formed by the stream flowing through them. Soil textures varied from very fine loam to sand. The subsurface was usually saturated with ground water. Most of such land, especially the better types, were irrigated.

Stony Land:

Stony lands were areas of level to gently rolling land with a surface mantle of glacial debris of large stones or boulders from three to five inches or larger, and used only for grazing.

Appendix G

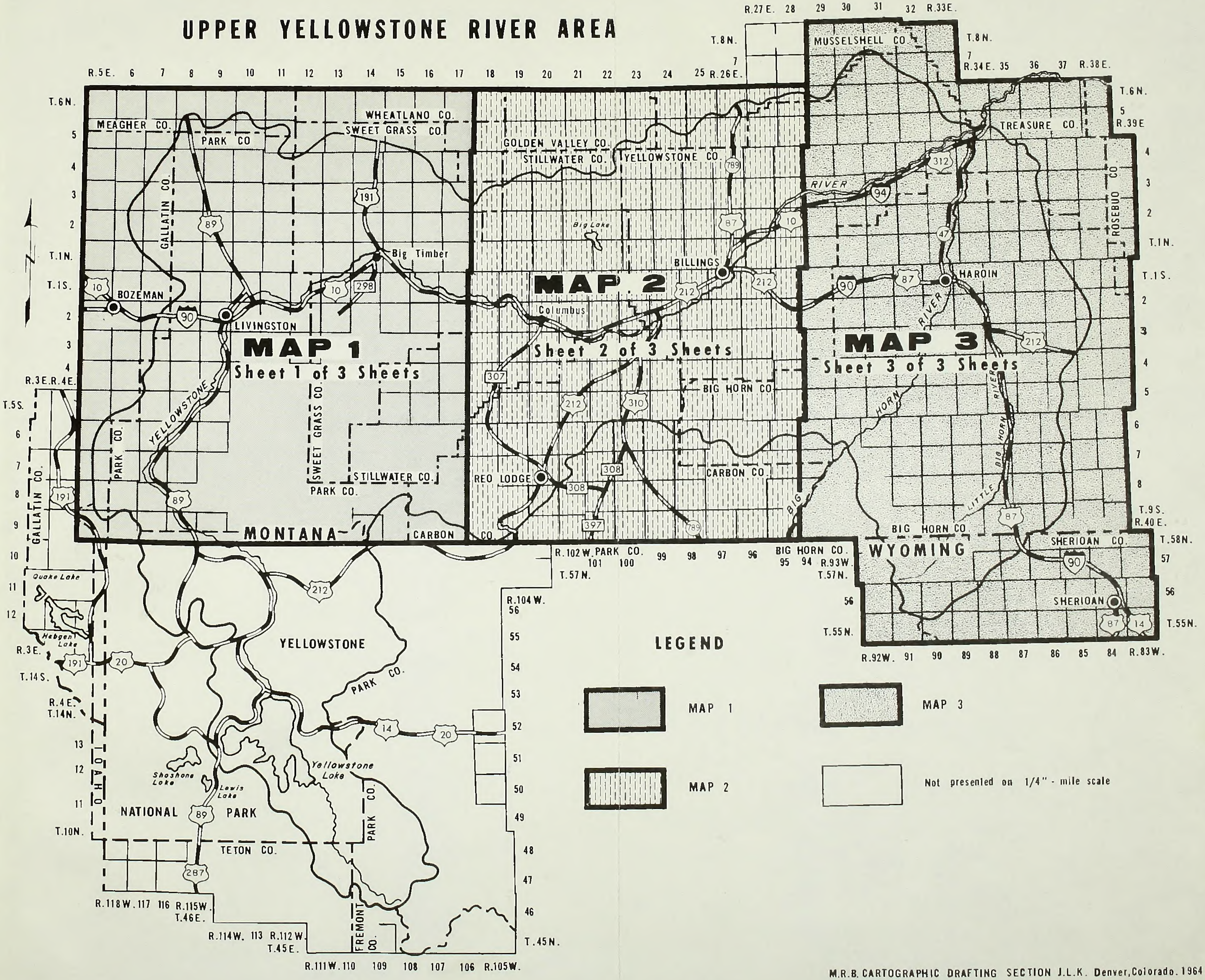
UPPER YELLOWSTONE RIVER AREA
LOCATION OF MINERAL RESOURCES*



* Source-Bulletin 19, Montana Bureau of Mines and Geology-1956.

M.R.B. CARTOGRAPHIC DRAFTING SECTION J.L.K. Denver, Colorado. 1964.

UPPER YELLOWSTONE RIVER AREA



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UNITED STATES DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

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MAP 1
UPPER YELLOWSTONE RIVER AREA
SHEET 1 of 3
MONTANA

MISSOURI RIVER BASIN STUDIES
DENVER, COLORADO
1964

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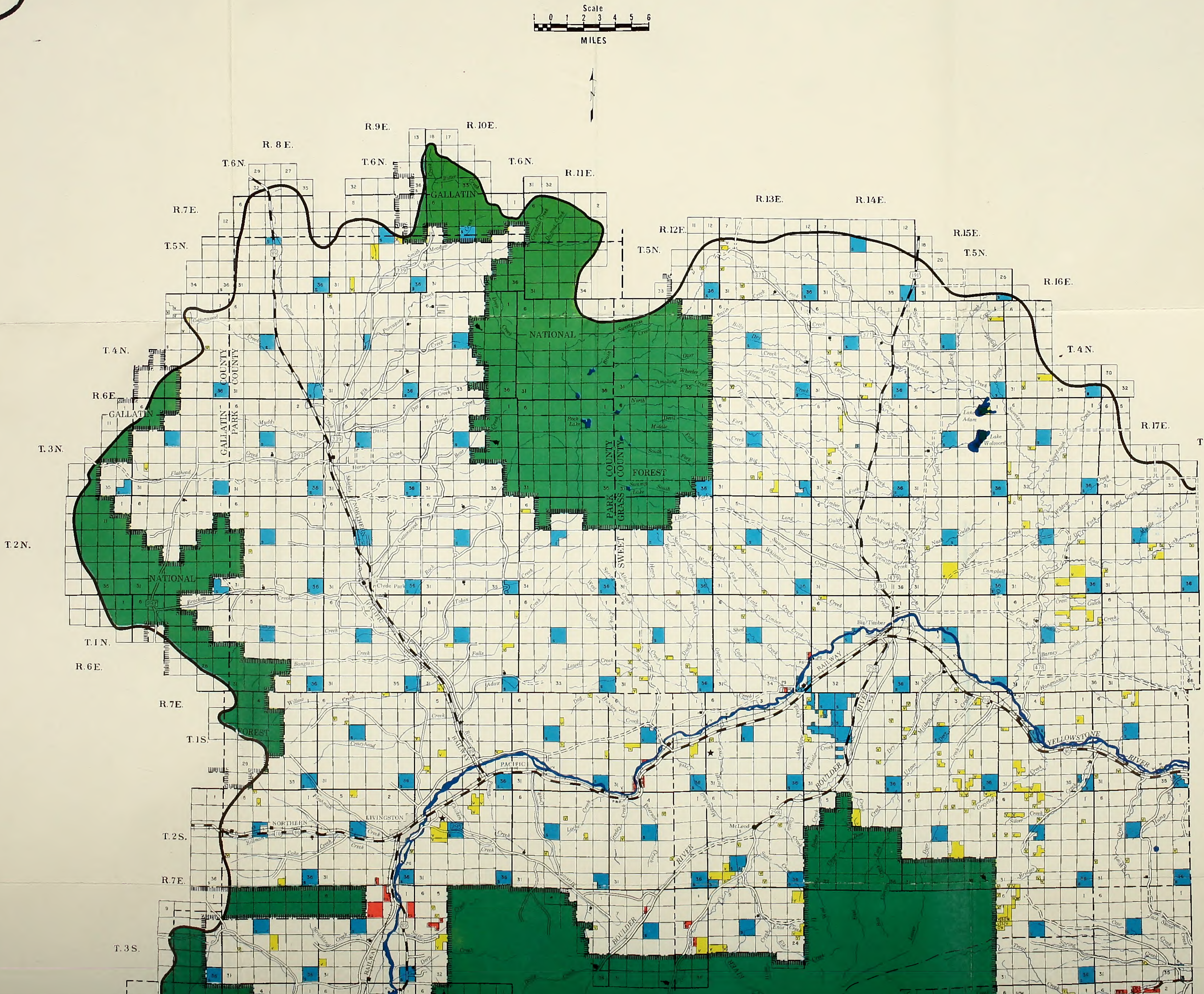

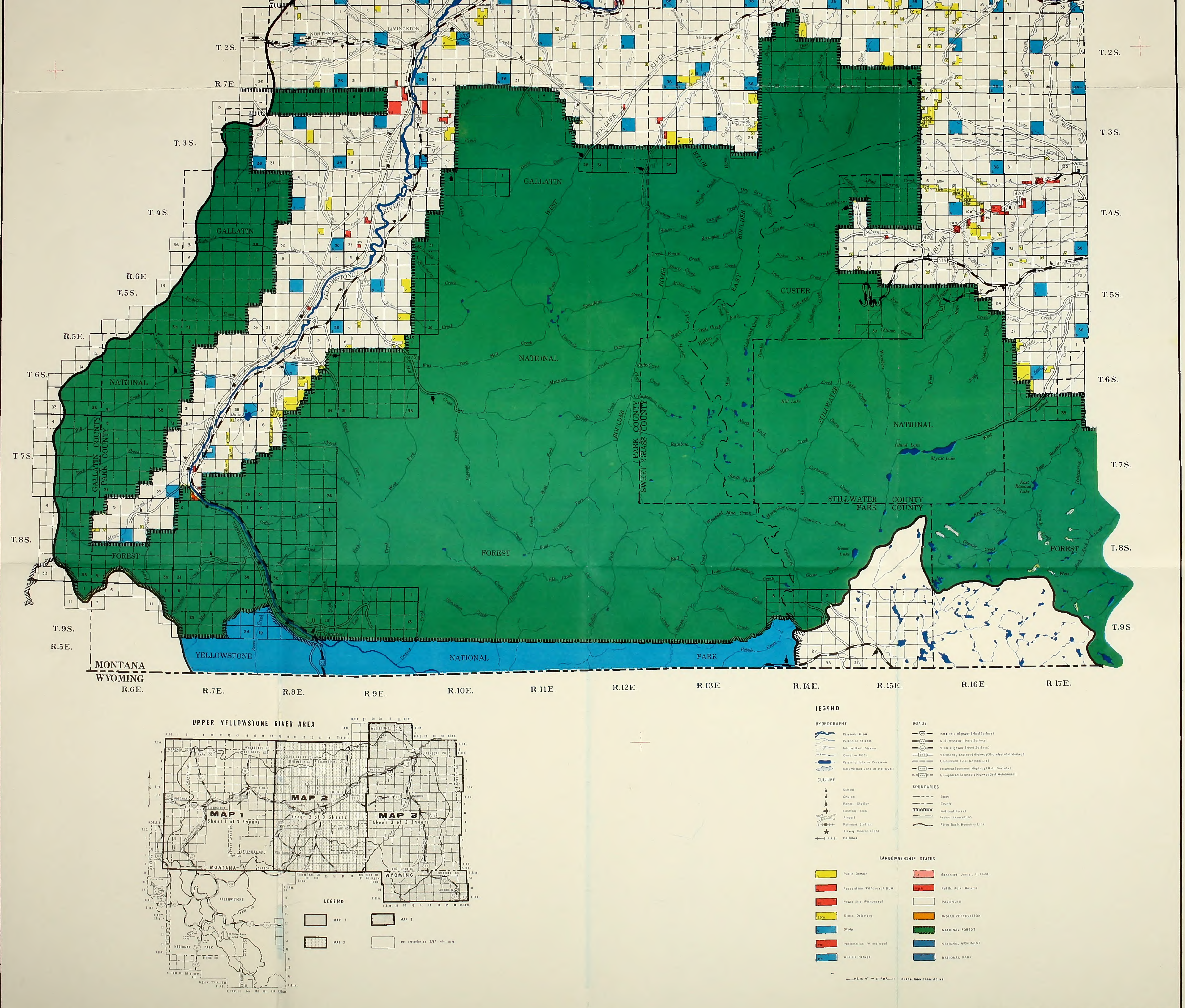

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MAP 2
UPPER YELLOWSTONE RIVER AREA
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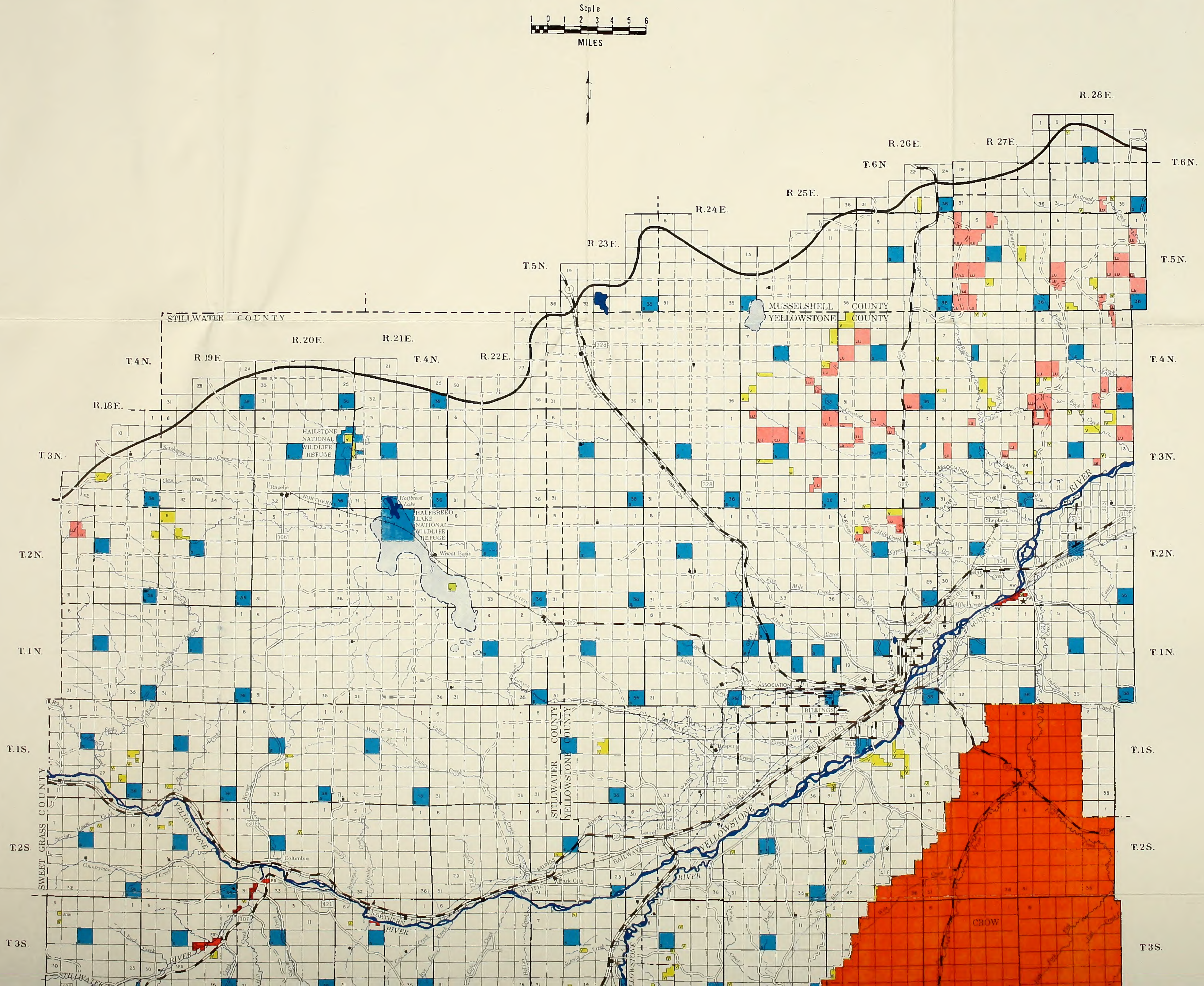

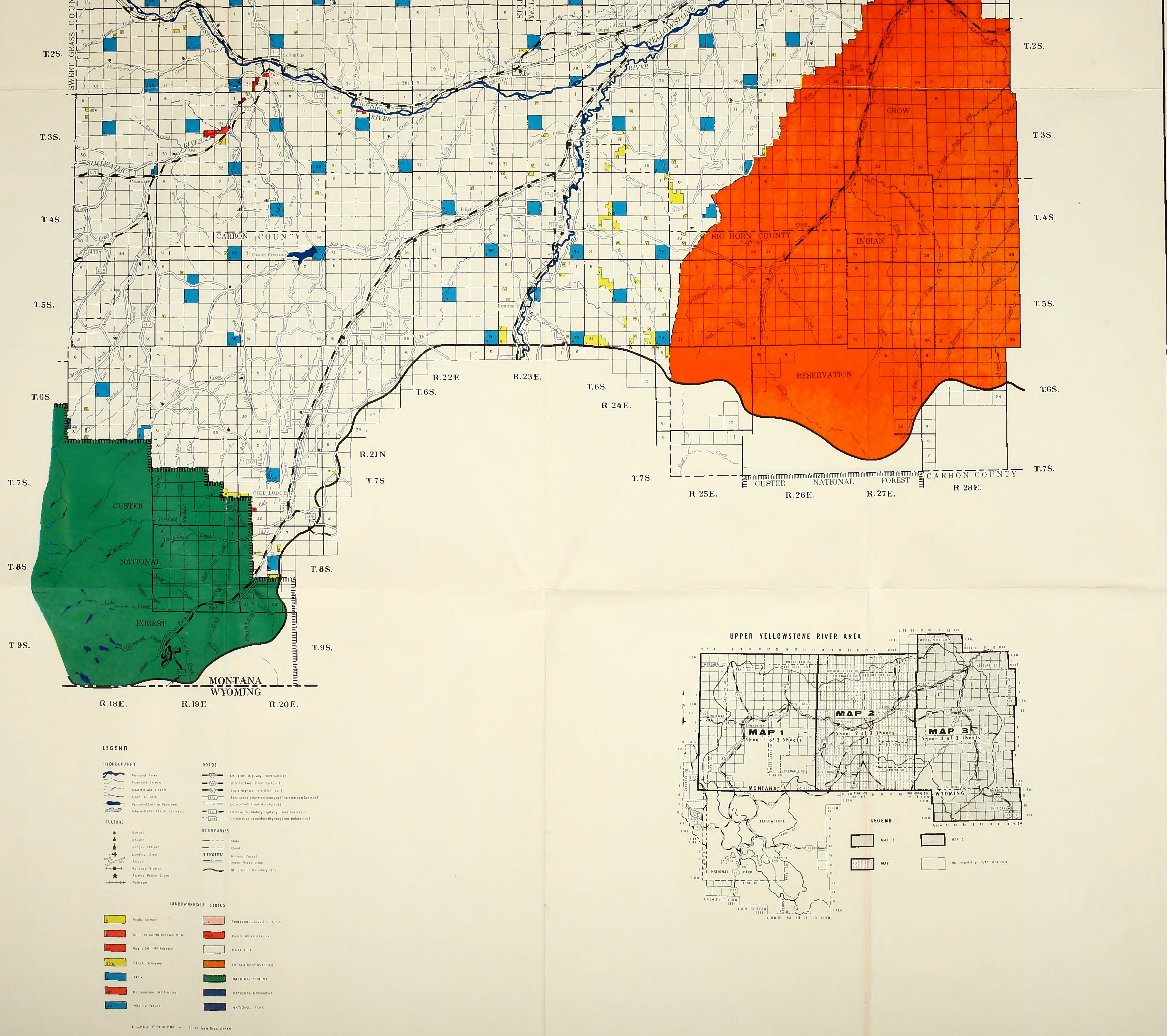

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MAP 3

UPPER YELLOWSTONE RIVER AREA

SHEET 3 of 3

MONTANA and WYOMING

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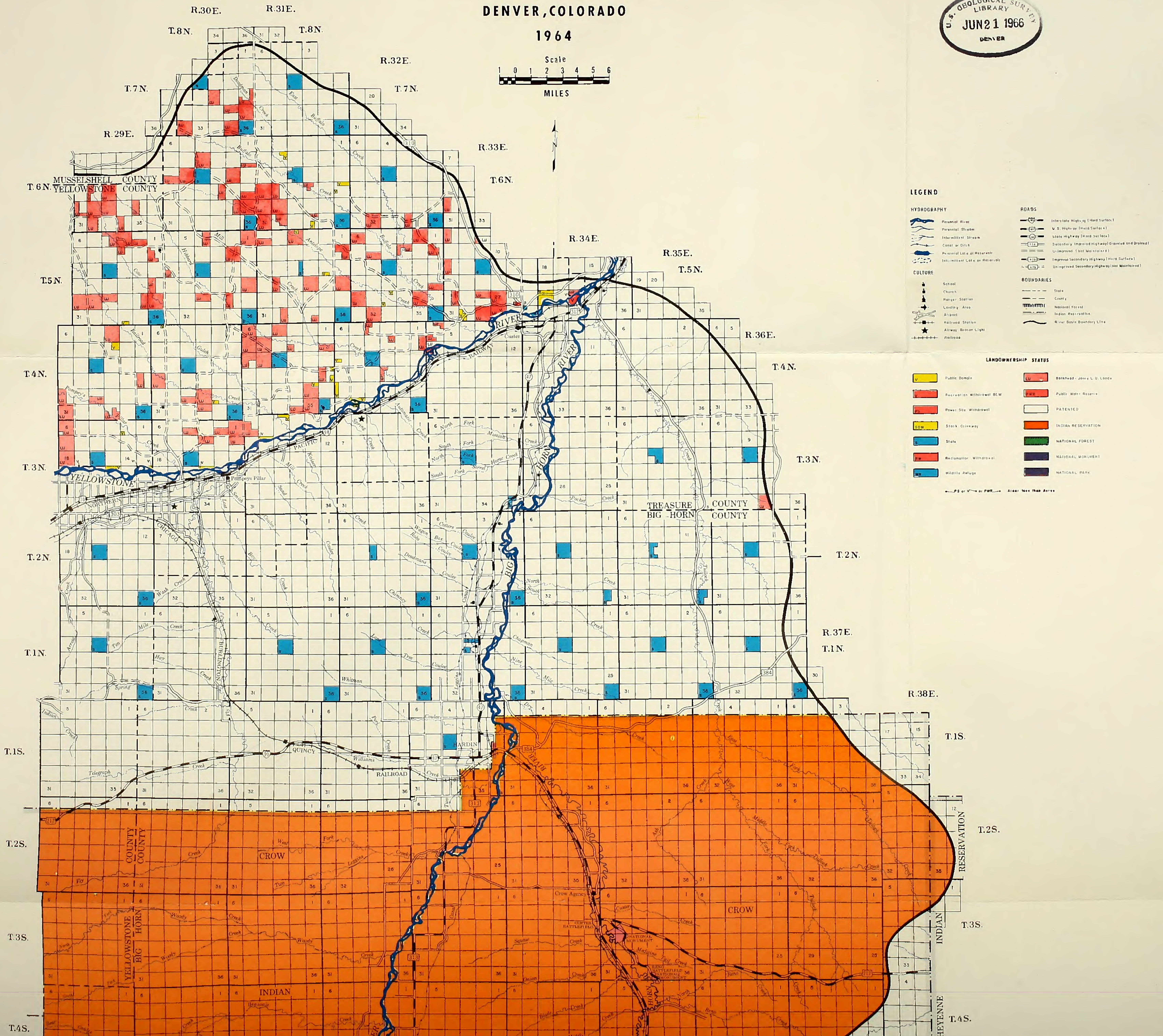

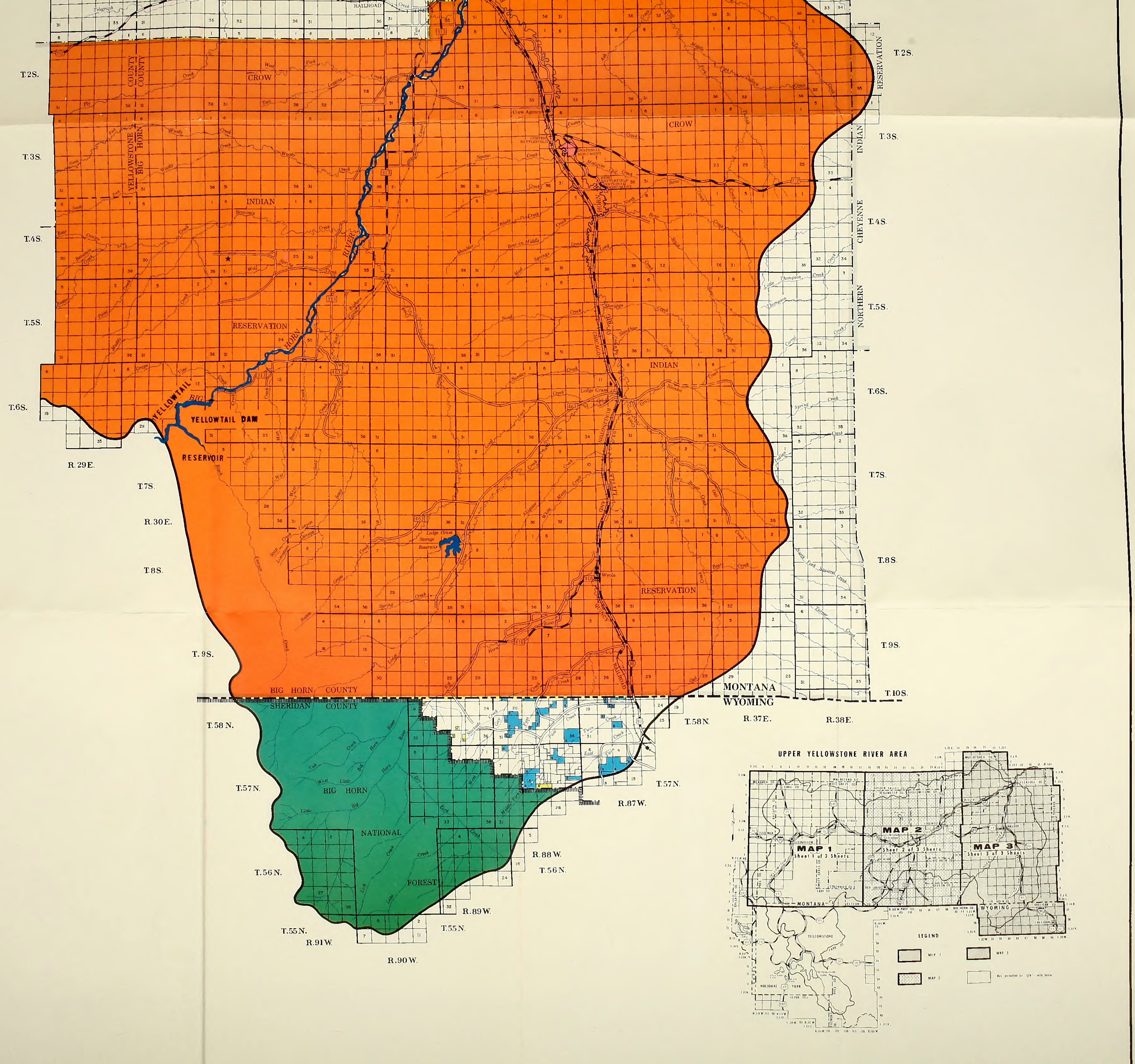

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